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1/6

THE CHEMIST AND DRUGGIST

ESTAB 1859

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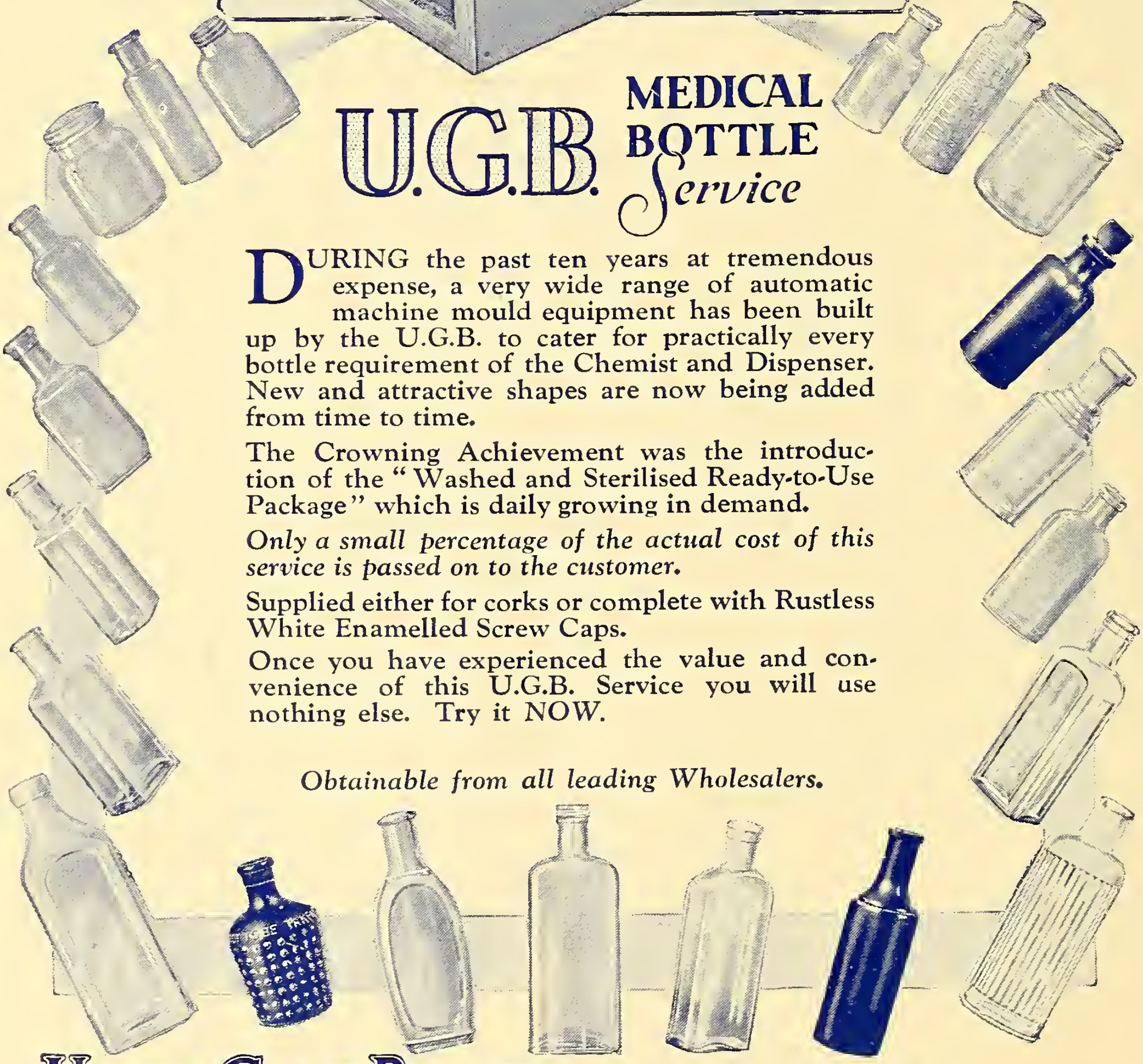

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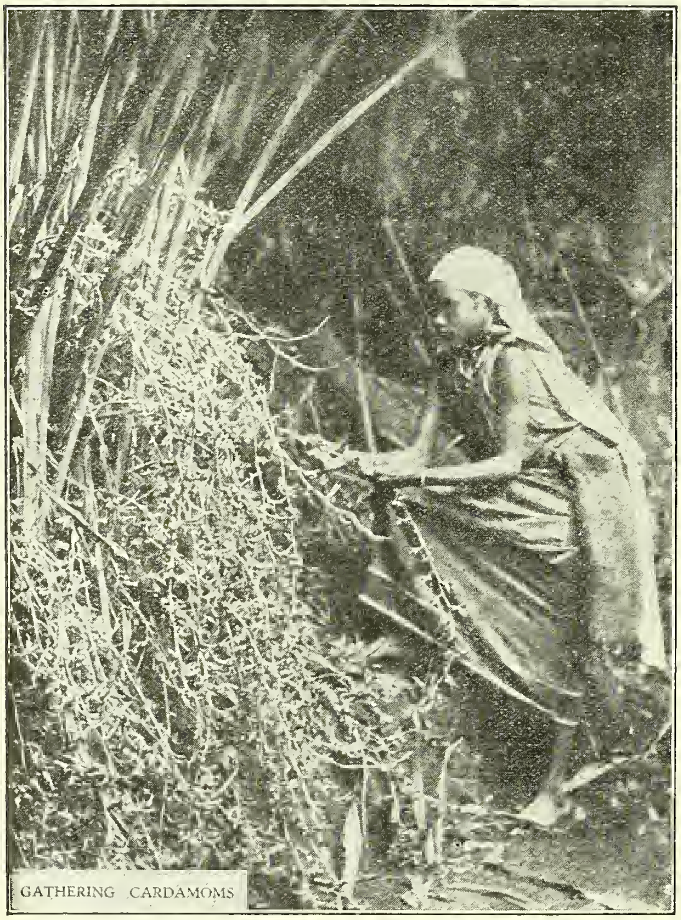

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CARDAMOMS

INDIA

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handle large quantities of Cardamom fruits and seeds which they use in the manufacture of official and unofficial preparations of the drug.

CARDAMOMS have a long history. They were known to the ancients, used medicinally by Hippocrates, and were a trade spice from at least the second century A.D. However, it is probable that the Cardamom in favour to-day is not the same variety as that referred to by Greek and Roman writers.

Elettaria Cardamomum, Maton (Fam. Scitamineae) is the plant whose seeds are used in modern pharmacy and confectionery. The words Cardamom and Amomum are from the Greek and Latin, Elettaria being derived from the Sanskrit "Eta," by derivatives of which the spice has been known in India for centuries. The plant is indigenous to Southern India, is cultivated there (Malabar Coast) and in Ceylon. Several varieties are recognised, the commercially valuable being Mysore, Malabar, Mangalore and Ceylon. The first mentioned is imported to the largest extent. Microscopical examination must often be made in order to identify the different varieties. The seeds which are the part of the plant used owe their aromatic properties to a volatile oil, 5 per cent.

Care has to be exercised by the natives in collecting Cardamom so as to avoid picking over-ripe fruit which split in drying. A special scissors is employed by which the fruit with a portion of stalk is cut off. About 10 lbs. is the average weight of fruit picked by a coolie in a day.

Cardamom is official in the B.P., and in other pharmacopœias. It is prescribed as an aromatic and for its cordial and stimulant properties.

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COWPER STREET, LONDON, E.C.2

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ELASTO RESTORES THE NATURAL POWER OF HEALING TO THE BLOOD
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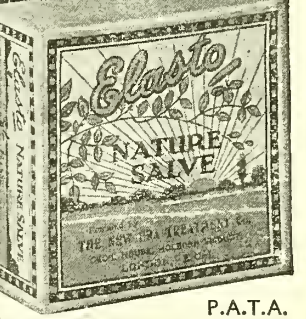

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1/-
This box contains 6 doses of approximately one half grain each for Infants about 3 years old.
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Contains NEW SCIENTIFIC information on the Ailments of the dog and their treatment. It will surely attract a profitable Canine Trade and it is

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An alternative pack to our Screw Cap Series.

We can now supply the following lines in Best White Flats, Cork Mouth with Viscose Caps, Script Labels, Cellophane wrapped.

Castor Oil.
Cod Liver Oil.
Extract of Cascara Liquid.
Glycerine.
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Paraffin, Liquid.
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Friars Balsam.
Glycerine of Thymol.
Olive Oil, Medicinal.
Quinine & Iron Tonic.

Customer's Own Name and Address on three dozen.

Prices and Contract Discounts the same as for Screw Cap Series.

Write now for Sample Bottles and particulars of our Terms.

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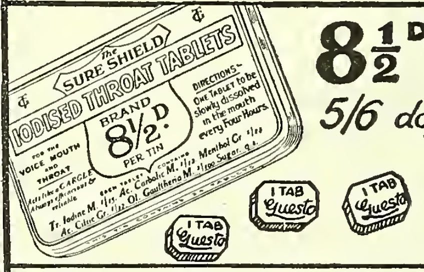
Meet the BIG DEMAND

BY LAYING IN STOCKS OF

"SURE SHIELD"

BRAND

Iodised THROAT TABLETS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IODISED THROAT TABLETS
BRAND
8½D.
PER TIN
FOR THE VOICE MOUTH AND THROAT
DIRECTIONS—One tablet to be slowly dissolved in the mouth every Four Hours.
1 TAB Guesto
1 TAB Guesto
1 TAB Guesto

8½D Tins

5/6 doz 63/- per gross

1/3 Tins

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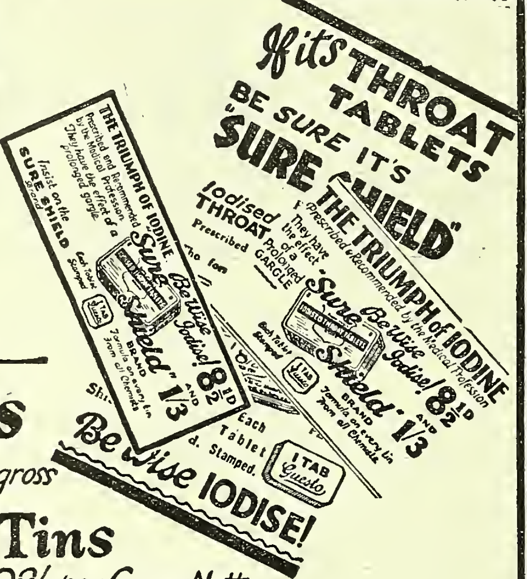
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THE TRIUMPH OF IODINE
Prescribed & Recommended by the Medical Profession
Iodised THROAT
They have the effect of a Prolonged GARGLE
Prescribed GARGLE
Be Wise Iodise!
"Sure Shield" BRAND 8½D AND 1/3
Formula on every tin from all Chemists
Each Tablet Stamped

THE TRIUMPH OF IODINE
Prescribed and Recommended by the Medical Profession
They have the effect of a prolonged gargle
Insist on the SURE SHIELD Brand
Each Tablet Stamped
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"Sure Shield" BRAND 8½D AND 1/3
Formula on every tin from all Chemists

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1 TAB Guesto
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The SUMMER HEALTH DRINK

The Dainty Fruit Flavoured Cube which makes a Sparkling Effervescent Drink.

THE IDEAL COUNTER LINE WHICH SELLS AT SIGHT.

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Each with Glass Sugar Crusher.

ALSO IN BOXES OF 4 DOZEN CUBES.

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Please ask our Representative to demonstrate it to you.

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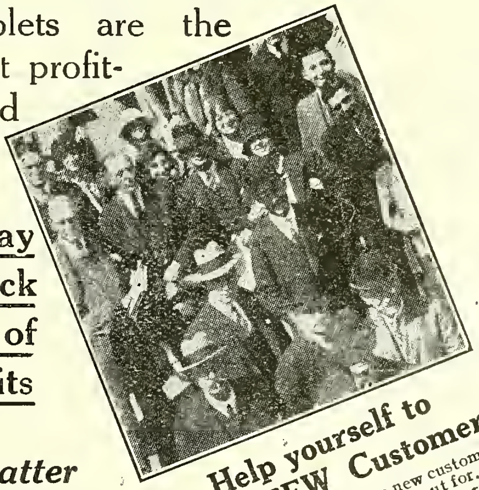
LIVERPOOL
College Lane

Is *YOUR* Business suffering from "INDIGESTION"?

You may have a feeling that your business is suffering a little from "indigestion"—from those various items which don't quite agree with it. Therefore, it might be worth while investigating the excellent results you can achieve with such a regular weekly profit maker as Moorland Brand Indigestion Tablets. A popular line that not only succeeds in satisfying present buyers, but has a happy knack of winning New customers every day—the bold and forceful National Advertising Campaign creates these new customers and the superior quality of the product retains them. We can say without fear of contradiction that Moorland Brand Indigestion Tablets are the greatest selling and most profitable tablets of their kind on the market to-day.



Help yourself to More NEW Customers

Every business wants more new customers, and they are well worth going out for. Get more new customers into your pharmacy through this vigorous Moorland Advertising. You will get them if you link up your own pharmacy with this campaign. The public will want Moorlands, and more and more customers will be sent to you.

Keep up a good display of these Wonderful Quick Sellers and be *Sure* of increasing your profits

Heaps of Good Showmatter sent FREE with every order

W. B. CARTWRIGHT LTD. RAWDON NEAR LEEDS

The "ORIGINAL"
Southalls ORIGINAL SANITARY TOWEL
SIZE 2
17
SOUTHALLS Celtex SOLUBLE TOWELS
WITH LOOPS SIZE 2
ONE DOZEN MADE IN ENGLAND
Celtex
The "CELTEX"
SOUTHALLS "K" SANITARY TOWELS
Size K2
The "K"
SOUTHALLS SANITARY TOWEL
The "COMPRESSED"

FOUR SAFE SELLERS

Wanted in all seasons and your profit assured

Your customers know they can thoroughly rely on every Southalls product. Stock these safe-selling lines and maintain your reputation for quality.

Southalls Reg^d

SANITARY TOWELS

THROUGH WHOLESALE HOUSES PLEASE

How Many Tooth Brushes

Do You Stock?

Multiplication of stocks is one of the chief causes of loss in the chemist's business.

Tooth brushes are a typical example! It is possible to duplicate tooth brush stocks so often, to carry so many patterns and makes, that, taken as a whole, the business is unprofitable.

The Meritor series of Bone and Celluloid Brushes have been planned to save duplication of stocks and to make the chemist's tooth brush business more profitable.

With these two tooth brush cases you can work your tooth brush business on a minimum capital and at maximum profit.

You will cover a sufficient range of patterns and sizes to suit all customers. You will have the means of displaying your brushes effectively and continuously and of carrying your stocks conveniently and economically.

Above all, you will be running your own line of tooth brushes—a branded brush which no outside retailer can sell. You will be helping to protect prices and to safeguard your own profits.

You will be building your tooth brush business on modern, rational methods, with fair prices and fair profits as a foundation. You will be working for to-morrow as well as for to-day.

The Meritor Cases are supplied free with standard stocks of brushes—bone brushes to the value of £2 19s. 2d., Celluloid brushes to the value of £2 19s. 6d. A complete tooth brush stock of 10½ dozen brushes, with display cases, for less than £6.

S. Maw, Son & Sons, Ltd.,
Aldersgate St., London,
and Barnet.

TRADE MARK

A HOME DRY CLEANER WITH A THOUSAND USES

Indispensable!

"VELT" is now one of the best packed lines before the public. 3 ozs. of "VELT" is contained in a hexagonal bottle, packed in a patent circular drum with a striking design.

"VELT" is, of course, an old favourite, and anyone who has actually tried it knows its wonderful properties. There are thousands of households to-day who would never be without "Velt" in the store cupboard.

It is Always in Constant Use.

VELT

THE HOME DRY CLEANER

THE SAFE HOME DRY CLEANER
NON-INFLAMMABLE
VELT
REGD
LIQUID CLEANER
INSTANTLY REMOVES OIL, GREASE & TAR STAINS
MADE BY WHITAKER & Co (KENDAL) Ltd KENDAL, ENGLAND.

Non-Inflammable!

"VELT" is absolutely Non-inflammable, and thus the definite risk of fire and burns which attends the use of various inflammable cleaners is entirely eliminated.

VELT instantly removes oil, grease and tar stains from clothing, upholstery, etc.

VELT is entirely harmless in use.

VELT is colourless and leaves no ring.

VELT is invaluable in the Garage as a tar remover.

Price 8/- per dozen.
Retail 1/- per bottle.

SEND A TRIAL ORDER TO-DAY TO

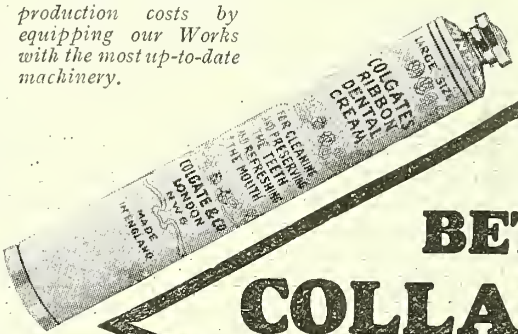
WHITAKER & CO. (KENDAL) LTD.

Dye Specialists, KENDAL, ENG.

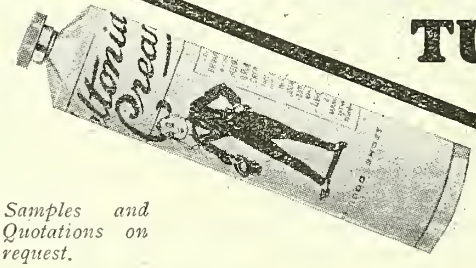
PROPRIETORS of LUTON Straw Hat Dyes, AURORAL Cold Water Dyes, WINNER Stocking Dyes WINNER Home Dyes, etc.

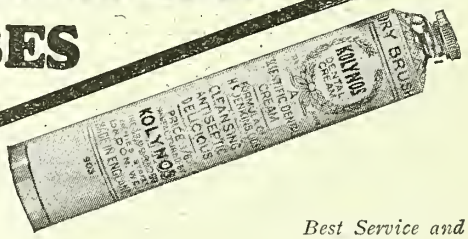
We have minimised production costs by equipping our Works with the most up-to-date machinery.

These Tubes are of the highest quality and finish combined with as low prices as any house in the Trade.


LARGE SIZE
COLGATE'S RIBBON DENTAL CREAM
FOR CLEANING AND PRESERVING THE TEETH AND REFRESHING THE MOUTH
COLGATE & CO LONDON
MADE IN ENGLAND

BETTS COLLAPSIBLE TUBES





Samples and Quotations on request.

Best Service and Delivery.

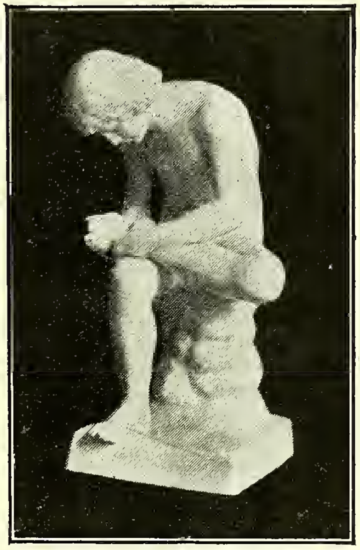
ESTABLISHED 1857

BETTS & CO. LTD. 1 WHARF ROAD, CITY ROAD, LONDON, N.1.

BIG BONUS OFFER!

WE GIVE YOU

One doz. 1/3 "CORNOL" CORN REMOVER with a 3 dozen order.



YOU GIVE US

A prominent show in your window for not less than two weeks.

We send you 4 dozen "CORNOL" CORN REMOVER and charge you for 3 dozen. Thus you make a profit of 45% on selling price, or 83% on cost. Your actual profit in money is £1. 7s. 3d. on an outlay of £1. 12s. 9d. —nearly 7d. profit on every bottle.

Very striking advertising matter Free.

CORNOL

BRAND

CORN REMOVER

X BONUS OFFER X

	Cost	Sells for
3 doz. 1/3 "Cornol" Brand Corn Remover at 11/6	£1 14 6	£2 5 0
1 doz. FREE - - - - - -		15 0
Less 5% one Month - - - - -	1 9	
	£1 12 9	£3 0 0

You spend £1. 12. 9. You get back £3. 0. 0. That is £1. 7. 3. Clear Profit.
This means nearly 7d. Profit on every Bottle.

THOMPSON & CAPPER WHOLESALE LTD.
MANESTY BUILDINGS, COLLEGE LANE, LIVERPOOL.

for your

D&P

dept...

less waste—
better results—
more customers—
bigger profits—

IF YOU USE

SELO REGD.

GASLIGHT

MADE SPECIALLY TO SUIT D&P REQUIREMENTS

DISTRIBUTED BY ILFORD LIMITED · ILFORD · LONDON

A DOUBLE SIZE

HIBISCUS

HAIR CREAM

PUT A WINDOW IN NOW

FOR THE HOLIDAYS

THE HAIR CREAM OF THIS DECADE

POPULAR SIZE	
Retail	1/3
Per dozen	9/-
6 dozen lots	@ 8/6
Gross lots	@ 8/-
DOUBLE SIZE	
Retail	2/-
Per dozen	15/-
6 dozen lots	@ 14/6
Gross lots	@ 14/-

Showcards in great variety and display plinths with all orders.

'HIBISCUS'
for the well groomed man
you can shake
ch lets
out
ap
to
HIBISCUS HAIR CREAM AYRTONS LIVERPOOL
HIBISCUS PINE TAR SHAMPOO AYRTONS LIVERPOOL ENG.
HIBISCUS HAIR CREAM AYRTONS LIVERPOOL
HIBISCUS BAY RUM AND CANTHARIDES AYRTONS LIVERPOOL ENG.
HIBISCUS PINE TAR SHAMPOO

AYRTON SAUNDERS
& CO. LTD.
LIVERPOOL

IONONE
100%

White, Tomkins & Courage Ltd.
REIGATE

REI GATE
REGISTERED TRADE MARK

MYSORE GOVERNMENT
SANDALWOOD OIL
DISTILLED FROM SANTALUM ALBUM, LINN.

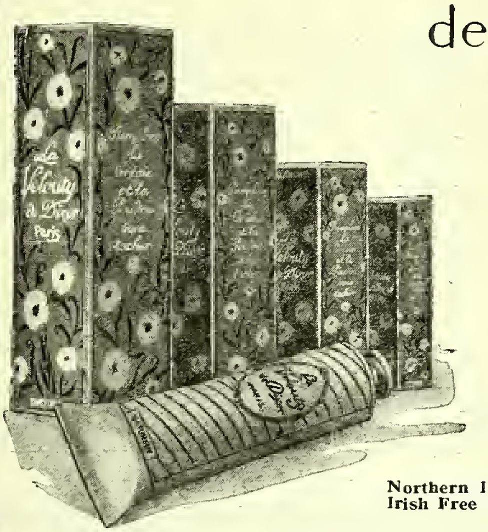
This Mark is the GUARANTEE

Trade Commissioner for Mysore in London
Grand Buildings, Trafalgar Square, LONDON, W.C.2
Telephone: Gerrard 4412.
Sole Agents for America: Messrs. W. J. BUSH & Co. Inc., 370 Seventh Avenue, New York.
Sole Agents for Canada: Messrs. W. J. BUSH & Co. (Canada), Ltd., 432 St. Helen St., Montreal.

the original combined Cream and Powder

la VELOUTY

de DIXOR Paris



The advertised line that you are asked for.

NOW ON P.A.T.A.

Samples free upon receipt of trade card or billhead.

PRICES:—

No. 1.	Handbag tube	3/-	doz.	Retail -/4½
No. 2.	Small tube	- 4/-	,,	,, -/6
No. 3.	Medium tube	7/-	,,	,, 1/-
No. 4.	Large tube	- 14/-	,,	,, 2/-
No. 5.	Super tube	- 22/-	,,	,, 3/-
	Pots -	- 21/-	,,	,, 2/9

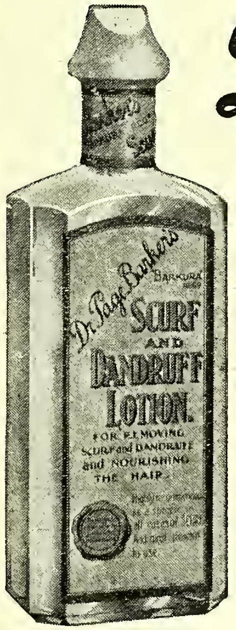
Made in four shades:

WHITE, IVORY, NATURAL and OCHRE.

Obtainable from your regular Wholesaler or direct from the Sole British Agents:

DEBACQ & HARROP,
68 Newman Street, Oxford Street, London, W.1.

Sole Distributors for
Northern Ireland: ROBERT MAYRS & CO., 43 Chichester Street, BELFAST
Irish Free State: MAY, ROBERTS & CO. LTD., Grand Canal Quay, DUBLIN


Dr. Page-Barker's
BARKURA
SCURF AND DANDRUFF LOTION.
FOR REMOVING SCURF and DANDRUFF and NOURISHING THE HAIR.

With every order for 3 dozen you get three 2/6 bottles as bonus, handsome metal showstand, and attractive showcards.

Dr. Page-Barker's

Scurf & Dandruff LOTION

The recognised specific for scurf

EVERY bottle of Dr. Page-Barker's Scurf Lotion bears a positive guarantee that it will eradicate scurf or the purchase price will be refunded. This makes it the easiest to sell of all hair and scalp specifics. And the profit is handsome.

2/6

P.A.T.A.

PER 18/- DOZEN

SEE OUR NEW & ARTISTIC SHOWCARDS

WRITE FOR EXPORT TERMS

A GUARANTEE WITH EVERY BOTTLE.

THOS. CHRISTY & CO., 4-12 OLD SWAN LANE, LONDON, E.C.4.

SHAVING CREAM
TRADE MARK
"AMO"
REGD
MADE IN ENGLAND
The Delightful and Emollient
SHAVING CREAM
Acts like a Skin food that—
MAKES SHAVING A PLEASURE
GUARANTEED BY AMO SAFETY RAZOR CO. BROAD ST. HOUSE LONDON E.C.2
BEST ON
"AMO"
SHAVING PRODUCTS
SHAVING BRUSH
GUARANTEED PURE HOG BRISTLE
"AMO" PRODUCTS LAST LONGER COST LESS

ILLUSTRATION IS ACTUAL SIZE

WRITE FOR

SPECIAL BONUS TERMS

AMO SAFETY RAZOR BLADE CO., LTD.
BROAD STREET HOUSE - - LONDON, E.C.2.

Always have a show of

BUTYWAVE SHAMPOO!

Because it makes new customers every day. They buy it. They like it. They thank you and become your friends—and it pays you handsomely. No other nationally advertised shampoo shows the same profit

80% on six dozen lots

(13 supplied to the dozen)

GELLE FRERES DENTIFRICE

Please Note NEW PRICES :—

1/-	Tubes,	No. 3020 @ **7/-**	doz.
9d.	,,	No. 3023 @ **5/-**	,,
1/6	,,	No. 3010 @ **12/-**	,,
1/9	Pots,	No. 3016 @ **12/6**	,,
1/3	,,	No. 3007 @ **8/6**	,,

Showing you an INCREASED MARGIN OF PROFIT

Order through your wholesaler, or direct from—

J. DUPONT & C^{IE}
18 FORE STREET, LONDON, E.C.2
Sole Agents for the United Kingdom

FOR CHEMISTS ONLY

BECAUSE of the mercuric iodide which it contains, Parke-Davis Shaving Cream can be sold by chemists only. Every tube ***must*** be purchased by the public from a pharmacy.

It is an excellent cream, well worthy of pharmaceutical recommendation. Men all over the country are trying it, and praising it. Sales are increasing rapidly.

Parke-Davis Shaving Cream allows the same good profit as Euthymol Tooth Paste. Moreover, it can be bought on special bonus terms. It is a line in which many chemists are taking a keen interest. Send for particulars of the terms available.

PARKE-DAVIS Shaving Cream

M.R.P. 1/6 per tube. M.W.P. 12/- per doz. net.

PARKE, DAVIS & CO.,
50 Beak Street - - London, W.1.

A. S. LLOYD'S
EUX-E-SIS.

For Shaving without Soap, Water, or Brush.

CAUTION.

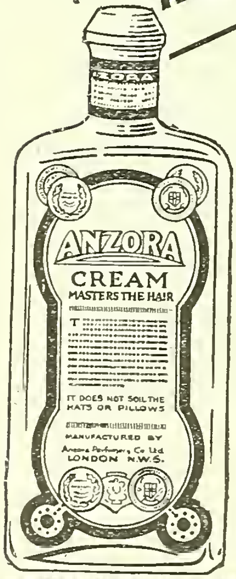
The Labels on GENUINE EUXESIS bear two signatures—A. S. Lloyd, in black ink, and that of his Widow, Aimée Lloyd, in RED. Refuse any other.

Tubes 1/6 & 3/- ~ 33⅓% Profit

Sole Manufacturers and Proprietors : **AIMÉE LLOYD & Co., Ltd.**
23 PANTON STREET, HAYMARKET, LONDON, S.W.

N.B.—When ordering from Wholesale Houses write LLOYD'S EUXESIS (WIDOW'S).

Anzora Customers are *Regular* Customers!



Once a man has tried Anzora he goes on buying it, bottle after bottle. It is by far the most popular of all hair fixatives, and is so well-known that it is one of the easiest-selling lines in the trade. Keep your Anzora stocks well up—the sales are increasing steadily every day!

TRADE TERMS:
12/- doz. Retail at 18/-
20/- doz. Retail at 30/-

Requirements for August Holiday week should be placed immediately.

ANZORA
MASTERS THE HAIR
ANZORA PERFUMERY CO., LTD.
London, N.W.6

"ODENTIC" PLATE BRUSH

Regd. No. 417637.

From all Wholesalers.
Packed in ½-dozen Display Boxes.
Manufacturers:
W. R. Speer & Son (EST. 100 YEARS)
215 DALSTON LANE - - LONDON, E.8
Agent for S. Africa—C. GORDON DAVIES & CO., National Bank Buildings, Pritchard Street, Johannesburg.

Pay more for "MIRROR" Blades -

they're worth it

The New Watts "Mirror" Blades

These wonderful Blades with their **Rustless Reinforced Edges of Stainless Steel** treated by a secret process are worth the extra cost. They are keener and give more and better shaves than any others on the market. The Edges are absolutely rustless in any climate.

Watts Mirror Blades
Packed in Patent Spring Lid Nickelled Containers of
10 *for* 3/4
Also Packed in cartons of
5 *for* 1/8
Giving the Retailer 66⅔% PROFIT on cost.

JOHN WATTS (Sheffield & London) Limited
Lambert Works, SHEFFIELD. Established over 150 years.
London: 18 Soho Square, W.1

A NEW LINE

"Aerofume" Deodoriser

These dainty containers are hung in bedroom, bathroom, office, nursery, etc., or can be carried in handbag, satchel, etc. Sold complete with "**AEROFUME**" charged pad, in cases of various artistic colours to harmonise with modern furnishings. Packed in attractively designed display cartons containing one dozen assorted colours. Sells on sight wherever shown.

PRICES OF

Deodorisers or Refills

1 doz. lots 4/- carriage extra
3 doz. lots - - 4/- per doz. carr. free
6 „ & upwards 3/9 „ „
RETAILS AT 6d. EACH

NO COUNTER CAN AFFORD TO BE WITHOUT THESE QUICK SELLERS.

Aerofume Refills

Retail at **6d.** each. In screw-top bottles containing twenty charges of "**AEROFUME**" for the Deodoriser or for spraying purposes. The merits of "**AEROFUME**" have been demonstrated during the past eight years and unqualified testimony given to its power and effectiveness in destroying germs and securing protection from moths.

Free supply of explanatory leaflets with all orders.

DO NOT FAIL TO SEE TO YOUR STOCK
as "**AEROFUME**" will be Nationally advertised

Obtainable from usual Wholesalers or from

WALDEN, WALDEN & CO., 15 GRAPE ST., LONDON, W.C.1

If its Customers you want

YOU SHOULD STOCK

PETAL DUST

"Wherein the subtle savour of the Flowers sublimely dwells."

THE GREAT FLORAL AIR PURIFIER

A TRIAL WILL CONVINCE YOU THAT—

PETAL DUST, when once shown, creates its own demand, and is therefore a valuable adjunct to every "go-ahead" store.

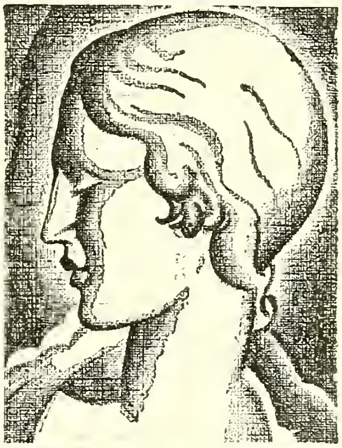
PETAL DUST, when displayed prominently upon your counter, will attract prudent customers by the fragrance of its unique odour, which to-day is of such universal admiration.

RETAILS IN PACKETS AT 4d. AND 8d. EACH.

Attractive Advertising matter free on request.

Obtainable through all the usual Wholesale Houses or from Sole Producers :—

THE ROSMARINE MANUFACTURING CO.
LONDON, S.E.1



BETTER BE SAFE THAN SORRY . . .

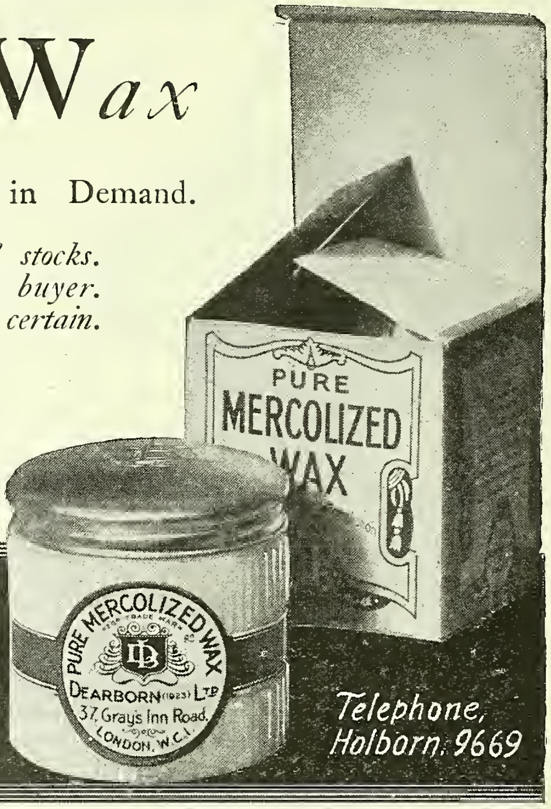
CUSTOMER-SATISFACTION IS STILL THE BEST POLICY

Protect your trade by protecting the customer. Sell Nuctone exclusively for recolouring of hair.

Order from your usual Wholesaler

Nuctone

SAFE FOR GREY HAIR



Mercolized Wax
for the Complexion
Extensively Advertised. Always in Demand.

There is no risk in holding full stocks.
Every woman is a potential buyer.
Sales are regular and repeats certain.

Stallax
a Shampoo—also popular,
and shows a handsome profit.

Dearborn
(1923) Limited
37 Gray's Inn Rd. London. W.C.1.

Telephone,
Holborn 9669

TAYLOR'S CIMOLITE TOILET POWDER
THE PERFECT POWDER FOR NURSERY USE

A perfectly bland and non-irritating Powder, Invaluable in all cases of Excoriations, Chafing, Roughness of the Skin, etc. Recommended by eminent skin doctors and recognised as the leading Toilet Powder for over 70 years by the nursing profession. Used in the Royal Households.

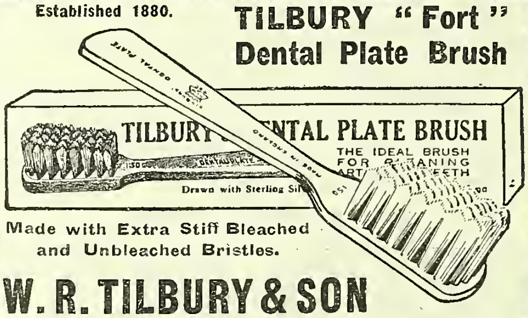
In deference to the many requests received from users of "CIMOLITE," a sprinkler tin to retail at **1/1½** is now available. This new packing is in addition to the familiar **1/1½** packet which is still on the market.

When ordering please specify TINS or PACKETS.

"CIMOLITE," in all sizes, also **CIMOLITE SOAP AND CREAM,** is stocked by all Wholesale Chemists and Druggists.

TERMS and ILLUSTRATED PRICE LISTS, also ATTRACTIVE SHOWCARDS, Counter Bills and other selling literature, obtainable from

JOHN TAYLOR, 30 Baker Street, Portman Square,
LONDON, W.1.

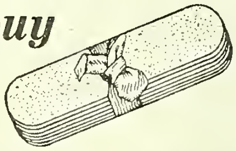

TILBURY DENTAL PLATE BRUSH
THE IDEAL BRUSH FOR CLEANING ARTIFICIAL TEETH
Drawn with Sterling Silver

Established 1880.

TILBURY "Fort" Dental Plate Brush

Made with Extra Stiff Bleached and Unbleached Bristles.

W. R. TILBURY & SON
47 FRAMPTON PARK ROAD, HACKNEY,
LONDON - - - ENGLAND

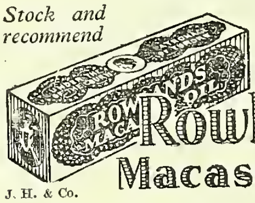


No need to buy abroad!

We can supply all your
MANICURE GOODS
At Prices which meet Foreign Competition

Wholesale Houses only supplied.

ROBERT LEE, 14 Calverley Grove,
Phone: Archway 2144. N.19



Selling Suggestions

Rowland's Macassar Oil keeps the hair naturally immaculate, for it controls the hair simply by making it soft and flexible.

Stock and recommend

Of all Wholesalers, to retail at **3/6, 7/-** and **10/6.**

Rowland's Macassar Oil

J. H. & Co.

A. ROWLAND & SONS, Ltd., 22 Laystall St., Rosebery Avenue, London, E.C.1

We are Increasing Our Advertising

We are now using the Daily, Sunday, Ladies' and Home Journals to advertise the Duchess Razor to women.

Increased Demand is Following

Are you carrying stock to meet the demand ?

Standard Models in Neat Metal Box

Nickelled	5/9
Silvered	10/6
Gilded	15/-
Cheaper models	3/6

Extra Blades, price 2/6 packet of 5

Show Material Supplied including the New Velvet Display Pad

THE DUCHESS

My Lady's Own Razor

ENTIRELY BRITISH

is a proved seller from the Perfumery Counter. It has one edge double curved for safe and clean underarm toilet and the other edge straight for neck and legs.

Stocked by CHIEF WHOLESALERS

TRADE TERMS $33\frac{1}{3}\%$

THE DUCHESS RAZOR CO.
318 CAMBERWELL NEW RD., S.E.5

BRITISH MADE

ROLL FILM MACHINES

1/-
1/-
FILMS
TO FIT ALL ROLL FILM CAMERAS 3¼×2¼
FILMS
TO FIT ALL ROLL FILM CAMERAS 3¼×2¼

Two Column for 2 Different Makes of Film

TO FIT ANY MAKE OF FILM

Price £7 10 0

H.P. TERMS on APPLICATION

We can also supply SINGLE COLUMN MACHINES

AUTOMATIC MACHINE Cº Lᴰ
HONG KONG WORKS
Tel : WEMBLEY 3731 WEMBLEY

RETAILS AT 2/-

Over half the men who come into your shop are potential purchasers of the "PIFCO" Razor Blade Sharpener and Stropper. Everybody who uses double-edge razor blades needs Sharpex. Everybody who sees it will be interested. Display it on your counter and let them try it.

Pifco Sharpex is patented the world over and is a really good new line to interest your customers. Show it with pride. Nothing to wear and cannot break.

Showcards and Folders free.

Supplied through your regular Factor.

If any difficulty, write patentees, Pifco, Ltd.
71 High Street,
Manchester.

The PIFCO SHARPEX

RAZOR BLADE SHARPENER

BEATSON, CLARK & CO.
LTD.
Chemical and Medical Glass Manufacturers
ROTHERHAM, YORKS.
Telegrams - - - "BEATSON, ROTHERHAM."

SHOP ROUNDS, OIL ROUNDS, POISONS, SYRUPS & ETHERS
WITH AND WITHOUT RECESS LABELS.

ESTABLISHED 1751.

ACTS LIKE A CHARM
FOR RED, ROUGH, CHAPPED HANDS
THE ORIGINAL AND BEST
“Veldt Cream”
1 oz.
FIVEPENCE
3 oz. 1/-, 6 oz. 1/9
12 oz. 2/9
WRITE FOR BONUS TERMS TO THE
VELDT LABORATORY
Springfield, Upper Clapton, LONDON, E.5

A POSTCARD ENLARGEMENT FREE
WITH EACH FILM DEVELOPED AND SIX PRINTS
POSTCARDS 2/6 doz. 4 for 1/-
from any negative or any photograph copied (negative extra). Colour work a speciality.
Less 33⅓% Wholesale Discount
HIGHEST CLASS WORK ONLY
Sole Agency for each Town or District. Fix up now in Front of your Competitor.

THE
"Owl" Photographic Service
SPOUT YARD, LOUTH, LINCS.

Tel. No. 226

Competition does
Not make him blink

DRY. SELF-FIXING. ALL SIZES.
Finest Quality and Appearance.

Bottle Caps

Enquiries Invited. Samples Submitted.

T. C. Bussell 47 MARK LANE
LONDON, E.C.3.
Phone : Royal 8327.

Medical, Surgical and Scientific.
Wholesale and Export only.
Inquiries invited.

IF YOU BUY ABROAD—
WE BOTH LOSE MONEY

GLASSWARE

NIPPLE SHIELDS,
IRRIGATORS,
Eye and Nasal Douches, Syringes and Surgical Glass Instruments.

POULTEN, SELFE & Co.
Harley Street, Bow Road, London, E.3. 'Phone: East 3334

BUY BRITISH

PYRAMID CORKS

TRADE MARK

are better than ever.

6 and 8 oz.

N.H.I.	5d.	per gr.
Ordinary	8¾d.	,,
Fine	1/1½	,,
Finest	1/8	,,

10 gross carriage paid.
20 gross - - less 5%.

Less 5% cash with order.

Write for full Price List and Size Gauge

N. W. Mitchell & Snow, Ltd.
"The Cork Firm."
Limehouse, London, E. 14.

PYRAMID TRADE MARK

WAGNER'S DRY BOTTLE CAPS

BEST IN QUALITY & APPEARANCE

Self-Fixing

R.V. WAGNER
33, Brooke St., London, E.C.1.
Tel. No: Holborn 5090

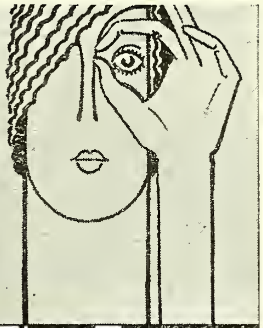
DISTILLED WATER
AT
$\frac{1}{3}$d. PER GALLON

By using Brown's Patent Automatic Water Stills pure distilled water may be obtained at the above cost, using steam at any pressure between 30 and 100 lbs. per square inch. The product is pure distilled water, *not* condensed water from steam service pipes.

Full particulars free on application. Enquiries are not followed by personal call.

MADE ALSO FOR GAS HEATING

BROWN & SON, LTD
Alembic Works, Wedmore St., London, N.19



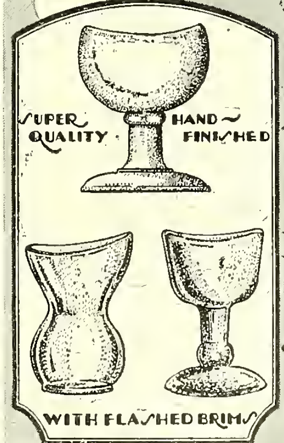
The Eye is an Important Organ

When treated only the best Appliances should be used. Supply your Customers, therefore, with one of our

EYE BATHS

of best English make

TRADE **W** MARK



Made in Clear Glass Actinic Green and Dark Blue.

◆ ◆ ◆

Packed in boxes of Six

◆ ◆ ◆

Sold by the leading Wholesalers

◆ ◆ ◆

WOOD BROS. GLASS Co LIMITED
BARNSLEY ◆ ◆ ◆ ENGLAND

GOOD
BOTTLES

make all the difference

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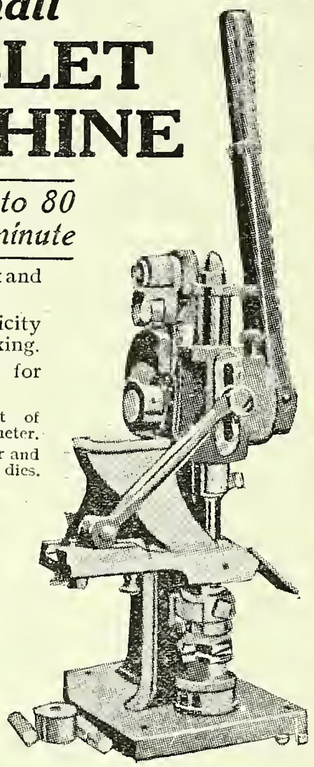

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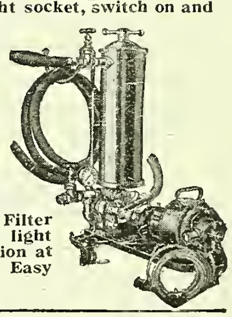

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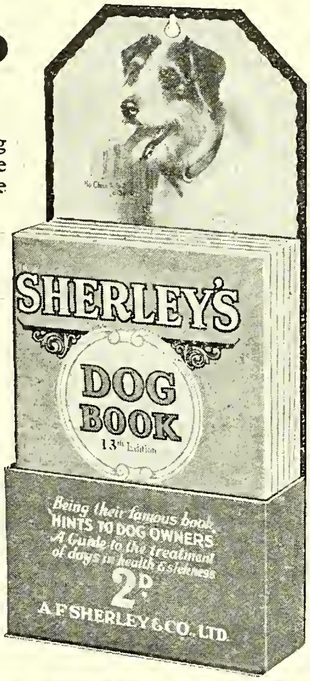
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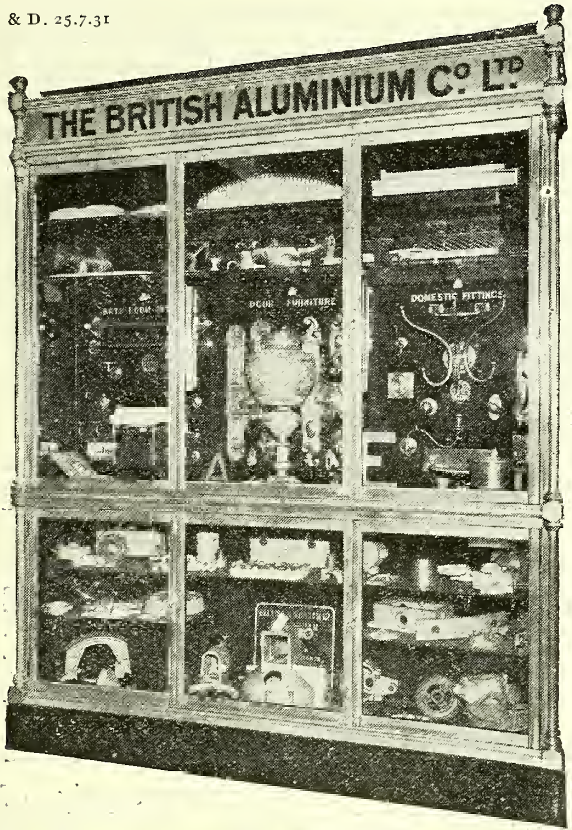

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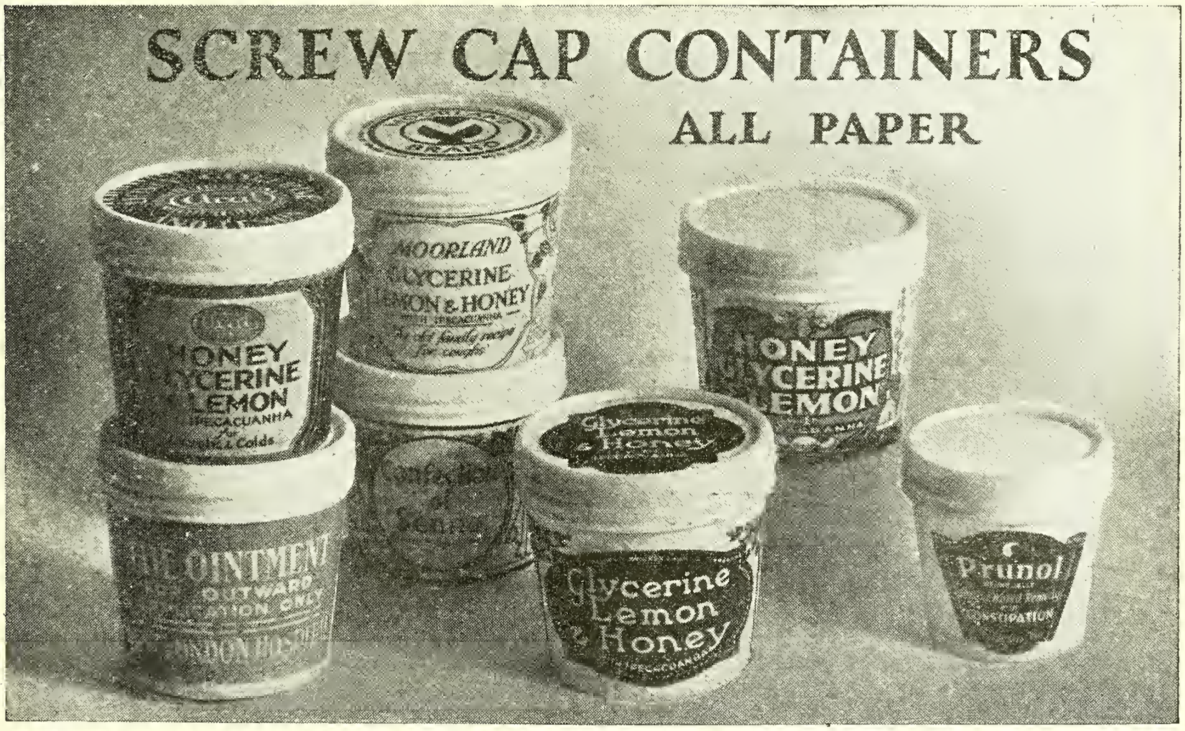

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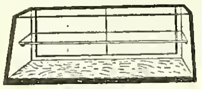

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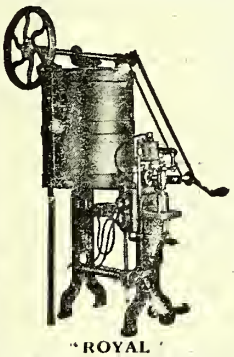

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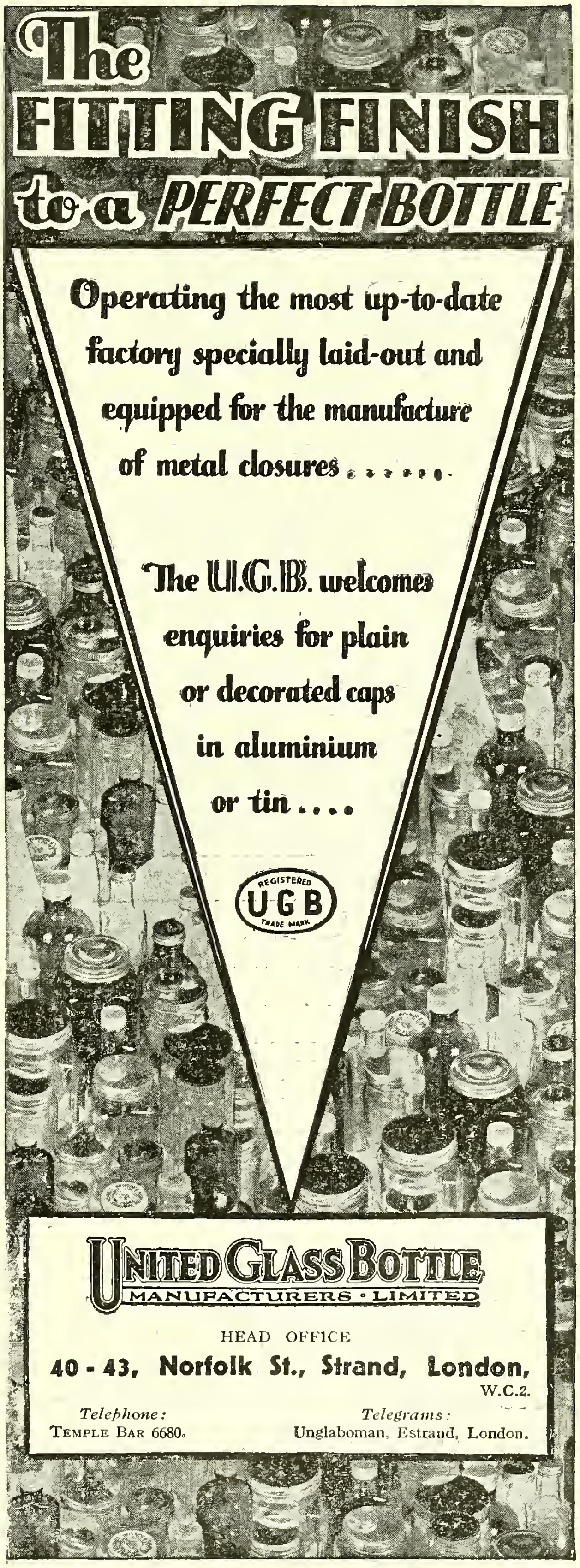

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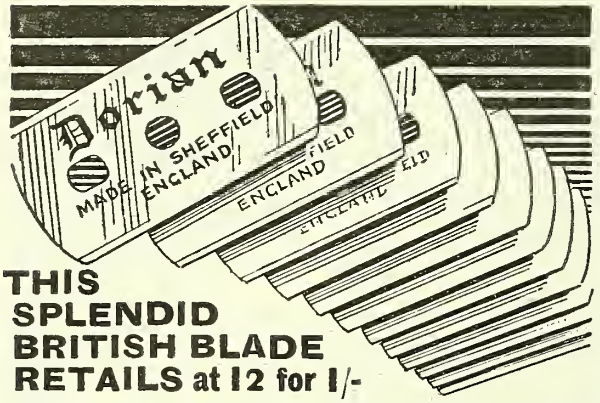

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The Chemists' and Druggists' Society of Ireland, and of
other Chemists' Societies in Overseas Dominions

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News of the Week

Merchandise Marks Orders

Among the Orders regarding the marking of imported goods recently issued from the Stationery Office are the Merchandise Marks (Imported Goods) No. 7 Order, 1931 (price 1d.) and the Merchandise Marks (Imported Goods) No. 11 Order, 1931 (price 1d.). The former deals with fertilisers and feeding-stuffs (*C. & D.*, January 31, p. 115), and came into force on June 20. The latter refers to crêpe bandages and crêpe binders made of wool, cotton silk, artificial silk or mixtures thereof (*C. & D.*, May 9, p. 531), and comes into force on September 29.

Inquests

An inquest was held at Broadstairs, on July 17, to determine the cause of the death of Miss Beryl A. Turton, a masseuse, who committed suicide by taking potassium cyanide. Mr. C. E. Wilkins, manager of the Broadstairs branch of Boots, Ltd., said he served Miss Turton with an ounce bottle of potassium cyanide a few days previously. She told him she wanted it for photographic use. The coroner found that the deceased committed suicide while of unsound mind.

At Rishton, on July 21, an inquest was held on the body of Alice Hartley, who died after drinking salts of lemon. The coroner said he would like to point out the ease with which this poison could still be obtained, not only in the market, but at almost every shop. He knew there was a Bill before Parliament to render it more difficult to obtain lethal poison, but he supposed they would have to wait a long time before Parliament found time to deal with the matter, which was, apparently, of little or no importance nationally. It was only coroners and people who dealt with these matters who thought they were important. A verdict of "Suicide with not sufficient evidence to show the state of her mind" was returned.

At Paignton, on July 9, the Devon coroner held an inquiry concerning the death of Mr. James B. Howard, chemist and druggist, Torquay Road, Preston, who was found in a dying condition at his premises on June 29. The deceased's brother-in-law, Mr. J. H. W. Dyer, Teignmouth, gave evidence as to the circumstances of the death. In reply to a question by the coroner, the witness said: "He was getting out a patent, and I think he was working too hard on it. It involved a considerable amount of microscopical work." Medical evidence and the report of Mr. Thomas Tickle, B.Sc., Ph.C., the county analyst, having been given, the coroner, expressing sympathy with the widow and children, returned a verdict of "Suicide while temporarily insane, death being due to strychnine poisoning."

Contracts

The following tenders have been accepted by the bodies named:—

Blackburn Education Authority.—C. A. Critchley & Co., Ltd., chemicals, etc.

Dover Town Council.—Boots, Ltd., drugs and sundries.

Guisborough Urban Council.—Mr. A. Leeming, chemist and druggist, drugs, etc.

India Store Department.—Southall Brothers & Barclay, Ltd., ampoules and chloroform.

Isle of Wight Public Assistance Committee.—Timothy Whites (1928), Ltd., drugs, etc.

Lichfield City Council.—Boots, Ltd., drugs.

Whitby Urban Council.—Mr. J. Brooks, chemist and druggist, drugs, etc.

Birmingham

Many local chemists are on holiday.

Under the will of the late Mr. R. E. Shorthouse, brother of Mr. H. S. Shorthouse, chemist and druggist, two beds have been endowed at the Birmingham General Hospital.

Sheffield

The Sheffield Pharmacies, Ltd., are undertaking sight-testing in patients' own homes if desired, for either N.H.I. or private patients.

The result of the Census shows that Sheffield, although it has only increased its population by forty-six persons in ten years, is still the fifth city in the country.

Miscellaneous

Window raided.—A smash-and-grab raid was made at the pharmacy of Shields & Warren, Chequer Street, St. Albans, on July 11, when a number of cameras were stolen.

Fire.—A fire occurred late on July 10, at the premises of Middleton & Co., Ltd., manufacturing chemists, Boundary Road, Middlesbrough, The origin of the outbreak is unknown.

Medicine Stamp Acts.—At Bradford Police Court, on July 10, J. W. Foggarty, Barrow-in-Furness, was fined £5, with costs, for selling a dutiable medicine without a proper wrapper and labels, and £5, with costs, for selling it without holding a licence.

Winning windows.—Prize-winners in the window display competitions organised in connection with the recent Bradford Historical Pageant Week included Taylors' Drug Co., Ltd, 65 Manchester Road, and Mr. J. W. Thorp, chemist and druggist, Killinghall Road.

Doctors oppose dividends.—At the annual representative meeting of the British Medical Association at Eastbourne, on July 18, a resolution was passed expressing strong opposition to any chemist being allowed to offer any reward or dividend to an insured person as an inducement to bring his prescription to be dispensed.

Herbalists' annual conference.—The sixty-seventh annual conference of the National Association of Medical Herbalists of Great Britain was held at Southport on July 14-16. Mr. W. T. Dawes (Plymouth), in the course of his presidential address, said that so far as the recognised medical school was concerned herbal medication has become a lost art. Yet what had been lost by the Royal College of Physicians had been made up by the increased knowledge gained by the medical herbalists.

Scottish Notes

Brevities

Instead of an expected boom in photography, business has reverted to cough mixtures and rheumatic remedies.

Mr. R. L. Harrow, curator of the Royal Botanic Garden, Edinburgh, has been appointed director of the Royal Horticultural Society's Gardens at Wisley.

Mr. Thomas Harley, chemist and druggist, the newly-elected president of Perth Rotary Club, delivered his presidential address to the members recently. Mr. Harley outlined the objects of the Rotary movement and emphasised the value of service.

The final tie for possession of the T. & H. Smith foursome trophy was played over the Craigmillar Park Course by members of the Edinburgh Pharmacy Golf Club, recently, when A. McDougall and J. S. Wilson defeated W. A. M. Hourston and W. H. Chambers.

A correspondent writes:—"The more one reads the correspondence pages of The Chemist and Druggist the more one realises that the profession of pharmacy in Scotland is, generally speaking, on a much higher level than in England, and the problems here are likewise different. It is good that we are much nearer the attainment of the ideal 'Pharmacy for the Pharmacist' than our friends over the border, but we wish to see their conditions rise to a higher level also."

Irish Notes

Pharmaceutical Society of Ireland

As a result of the examination held recently of candidates seeking to be placed on the Register as registered druggists, Mr. John Edward Elmes and Mr. Timothy Brendan O'Sullivan passed. Three candidates were rejected.

Brevities

A new medical hall has been opened at Ballyfaron under the title of the Kieran Medical Hall.

Mr. Andrew C. McBride, J.P., Ph.C., has been appointed a visiting justice to Armagh Prison.

Mr. Thos. A. Crooks, Ph.C., 6 Spencer Road, Londonderry, has been bereaved by the sudden death of his wife, which took place at her home on July 14.

The final stage of the Veterinary Surgeons Bill was taken in the Seanad of the Irish Free State of July 8, and on a division the bill passed by twenty-five votes to six.

In the recent Cookstown shopping week first prize for the window-dressing competition for chemists was won by Mr. C. A. Wray, Ph.C., with Messrs. Henry & Faulkner second.

An award of £6 was made to Mr. E. O'Grady, Ph.C., Michael Street, Waterford, at the local Circuit Court, recently, in respect of the damage caused by the scratching of his plate-glass window.

Two youths were charged at Whiteabbey Petty Sessions on July 9 with maliciously damaging a weighing-machine installed outside the premises of Mr. W. J. Farmer, Ph.C., Whiteabbey; on promising to make good the damage (28s.) the defendants were discharged.

Business Changes

Anthony & Son, chemists, are removing from 42 High Street, to 6 Mill Street, Bedford.

Mawson & Proctor, Ltd., chemists, are removing from 13 Grey Street to 23 New Bridge Street, Newcastle-on-Tyne.

The offices of the Argentine Chamber of Commerce in Great Britain have been removed to River Plate House, 12-13 South Place, London, E.C.2.

Mr. Wm. Vallans, chemist and druggist, 694 Christchurch Road, Boscombe, Bournemouth, has removed to larger premises at 678 Christchurch Road.

The Broughton Analytical Laboratories, consulting and analytical chemists, have removed their offices and laboratories to larger premises at 3 Ashbourne Grove, Higher Broughton, Manchester. Tel.: Broughton 2021.

Francis Newbery & Sons, Ltd., have acquired a controlling interest in the Chemists' Supply Co., Ltd., Bournemouth; Mr. W. J. Williams, M.P.S., F.C.I.S. (director and secretary of Francis Newbery & Sons, Ltd.), has been elected to the board of the Bournemouth company.

International Drug Congress

The fourth International Congress of Medicinal Plants opened at Paris on July 16, under the auspices of the International Colonial Exhibition. The opening session was under the chairmanship of Senator Charabot, representing the Minister of Agriculture, and M. Elbel, on behalf of the Minister of Commerce, assisted by Senator Mauger, the Dean of the Faculty of Pharmacy, and Professor Perrot (president of the International Federation for the Development of Medical, Aromatic and Similar Plants). Professor Radais (dean of the Faculty of Pharmacy) welcomed the delegates to the Congress. The following countries were represented:—Austria, Belgium, Bulgaria, Czecho-Slovakia, Germany, Holland, Hungary, Italy, Jugo-Slavia, Lithuania, Poland, Roumania, Spain, Switzerland and Syria. Professor Perrot, after thanking those who assisted in the organisation of the Congress, particularly M. du Vivier de Streel (president-general of the Congress) and Dean Radais, presented his address in which he explained that the Congress, which was representative of science, agriculture, industry and commerce, met to discuss the problems of production, improvement, transformation and trade in materials used for therapeutic purposes, hygiene, chemical industry and perfumery.

Science Meetings

The first science session of the Congress was held on July 17 at the Colonial Exhibition, and was presided over by Professors Appl, de Mori and de Graaf, M. Baube (president of the Syndicate of Essential Oils) and M. Lagneau presented a communication on "The Necessity for Unification of the Methods of Analysis of Essential Oils," Dr. Leclerc and Professor de Graaf presented respectively reports on "Renaissance of Phytotherapy" and "The Reason for the Abandonment by Practitioners of Medicinal Plants and their Galenicals." The importance of the foregoing papers was emphasised by Professor Perrot. M. Deneve (Belgium) presented an interesting paper on phytotherapy in general, the causes of its abandonment and reasons for a return to this method. Professor Zanelli (Italy) spoke on "The International Commercial Production of Medicinal Drugs."

In the afternoon the science meeting was resumed under the chairmanship of Professor Jan Muszynski. Dr. Zahlender read a paper on "Determination of the Rancidity of Oleaginous Seeds." Dr. Himmelbaur presented a communication on "The Form and Biological Significance of Alkaloids," which gave rise to observations by Dr. Hecht and Professor Perrot. Dr. Chevalier lectured on "The Ash in Vegetable Drugs" which was followed by an exchange of views between Professors de Graaf, Perrot, Himmelbaur, and Augustin. Professor Mascre presented the work of Dr. Boshart and the reports of MM. Mascre and Le François on the cultivation of digitalis.

After the meeting the delegates attended a reception given by the National Committee, Governor-General Olivier in the chair. During the function Professors Perrot and Himmelbaur, and the chairman emphasised the utility and success of the Congress.

Topical Reflections

By Xrayser

That Ipecacuanha Wine comes within Part II of the Poisons Schedule, as you had occasion to inform a correspondent recently, reminds me how inadequate is the knowledge possessed by some chemists and druggists in business on their own account respecting the scope of the existing Schedule of Poisons. Instead of devoting a little time to intensive study of the Schedule and finding how really extensive is the number of drugs and preparations which they alone may legally sell, they are apt to ignore regulations, and will even go the length of arguing that the law does not require them to use a poison label in cases where there is no doubt whatever about such a course being in order. So many of our fellow-craftsmen will not take the trouble to read their *C. & D.* regularly, or to associate with the rest of us at meetings, that they are apt to miss opportunities for increasing their stock of knowledge respecting the law's requirements. They prefer to carry on business in the way in which they have always been accustomed, and refrain from labelling certain preparations "Poison" in ignorance of the fact that the law now requires it. Unless they can be rescued from this state of ignorance a painful awakening awaits them if and when the Pharmacy and Poisons Bill becomes law, and inspectors appointed by the Pharmaceutical Society, armed with the power of entry and inquiry, discover that regulations which operate in the chemist's interest are not being observed by the chemist himself.

Rate of Profit has been receiving the attention of the Council of the Proprietary Articles Trade Association, the rate in this particular instance being that on branded articles, meaning medicines which would be liable to stamp duty but for the fact that they are sold under brand names. As is well known, the proprietors of a number of formerly stamped remedies took steps some time ago to render them not liable to duty, but they did not, as a rule, reduce the prices of the articles to the public, nor was there much done in the way of increasing the retailer's profit on sales. My sympathy is, therefore, strongly with the Council of the P.A.T.A., in deciding that a profit of not less than 25 per cent. should be available for the retailer before further branded medicinal articles are included in the Protected List (*C. & D.*, July 18, p. 65). Pity that the same rule is not enforced in the case of every proprietary medicinal preparation which has been converted from a stamped to a branded article; in fact, my suggestion would be 33½ per cent. in those instances.

Concentrated Infusions are to be included in the British Pharmacopœia now in course of preparation, and, much more remarkable, they are to be known under that name. In view of the fact that concentrated infusions are in general use and that preparations of greatly inferior quality are to be found on the market, the Pharmacy Subcomittee of the Pharmacopœia Commission has expressed the opinion that the Pharmacopœia should include standard formulas for such concentrated preparations (*C. & D.*, July 18, p. 69). Further, we are told that the preparations compare favourably with the best of the concentrated preparations at present to be found in commerce, and this is just as well, because making them official will compel all of us to use them when compounding mixtures in accordance with medical prescriptions. It should be a distinct advantage to have official concentrated preparations for use instead of fresh infusions, because there ought then to be greater uniformity in the appearance of mixtures dispensed in different pharmacies and in different parts of the country. Possibly there may be need of some check upon wholesalers who produce the concentrated preparations, so that uniformity shall prevail among those sold under the same names by different manufacturers, particularly as regards their colour when diluted.

Legal Reports

Photographic Sale after Closing Time.—At Wallasey, on July 17, Mr. John H. Crofts, chemist and druggist, Victoria Road, New Brighton, was summoned for an alleged contravention of the Early Closing Order under the Shop Hours Acts. Mr. Dodd, prosecuting for the Corporation, said this was a test case. In Wallasey there were forty shopkeepers selling films, and all but two were chemists. If any of these chemists kept open after hours for the sale of these films it practically nullified the Order made on the application of the majority of the chemists of the town. An inspector stated that before buying a film from Mr. Crofts after closing hours he told him who he was. The defendant thereupon showed him a letter from the solicitor to the Retail Pharmacists' Union advising him that he was entitled to sell films after closing time. The clerk said that the notice required to be exhibited in defendant's shop should have read, "This shop is closed for to-day except for the sale of medicines and surgical appliances and of photographic films by retail." The last six words did not appear on the printed notice produced. Mr. Harding, secretary of the local branch of the Photographic Union, said that in many chemists' shops to-day photographic materials and work constituted about 50 per cent. of the business done. Mr. S. Morgan, for the defence, urged that the selling of films was part of a chemist's business. The Bench ruled that the sale of films was not part of a chemist's business, and that the defendant had committed a breach of the law by not exhibiting the required notice. As a penalty was not sought, the case was dismissed under the Probation of Offenders' Act.

New Companies

and Company News

P.C. means Private Company and R.O. Registered Office.

H. E. Waight, Ltd. (P.C.).—Capital £200. Objects: To carry on the business of chemists and druggists, etc. R.O.: 221 High Street, Tooting, S.W.

R. J. Davis, Ltd. (P.C.).—Capital £1,000. Objects: To carry on the business of chemists, druggists, drysalters, oil and colourmen, etc. R.O.: Rialto Buildings, Upper Parliament Street, Liverpool.

Dressen & Stacquez Chemical Manufacturing Company, Ltd. (P.C.).—Capital £1,000. Objects: To acquire the business of chemical mnufacturers carried on by G. Dressen and P. Stacquez at Clavier, Belgium. R.O.: 61-2 Chancery Lane, W.C.2.

Oxygen Industries, Ltd. (P.C.).—Registered in Edinburgh. Capital £1,000. Objects: To carry on the business of manufacturers of oxygen, acetylene, nitrogen, hydrogen, carbon dioxide, compounds or mixtures, etc. R.O.: 145 St. Vincent Street, Glasgow.

Winstanley, Ltd. (P.C.).—Capital £500. Objects: To carry on the business of hairdressers, dealers in hair and other brushes, combs, razors, scissors, soap, sponges, perfumery and other toilet requisites, etc. R.O.: 80 High Street, Wimbledon.

Shield Seamless Rubber Co., Ltd. (P.C.).—Capital £1,000. Objects: To carry on the business of manufacturers of and dealers in medical contraceptives and surgical instruments of all kinds, shaving requisites and fancy toilet articles, etc. Secretary: A. C. Mason, 54 Walpole Road, Downhills Road, N.17.

MacAlistar, Ltd. (P.C.).—Capital £1,000. Objects: To carry on the business of hair dressers and dyers, masseurs, manicurists, wig makers, dealers in hair tonics and lotions, soaps, shampoos, creams, cosmetics, brushes, toilet requisites and fancy goods, etc. Solicitors: Dodson & Pulman, 11 Hammet Street, Taunton.

Veno Drug Co. (1925), Ltd.—It is now announced that dividends on the preference and preferred ordinary shares, payable on January 31 last, will be paid on July 29.

Major & Co., Ltd.—Report profit to March 31 was £13,739, against £22,285 for the previous year. Dividend on 6 per cent. cumulative preference shares for year ended March 31, £3,000; dividend on 7½ per cent. cumulative preference shares, £7,500; to depreciation, £4,418; directors' fees, £400; carried forward, £1,349. Investments, £135,843.

Voluntary Liquidation

Burkett, Sharp & Co., Ltd., 8 Harp Lane, London, E.C.3.—We are advised that, at a meeting of shareholders and creditors held this week, it was agreed that the company be wound up voluntarily.

Bankruptcy Reports

Re John Gee, 2 King Street East, Stockport, wholesale druggist. The first meeting of creditors was held on July 15 at the Official Receiver's Offices, Manchester. According to a statement of affairs, liabilities amounted to £773 19s. 9d. and net assets £61 18s. 9d., leaving a deficiency of £712 1s. 1d. The debtor said that in January 1929 with a capital of £95 he commenced trading as a wholesale druggist from his own house. In March 1931 he obtained a loan of £200, and on June 9 a writ was issued to recover that amount. The debtor was also sued by three other creditors. The case, being a summary one, was left in the hands of the Official Receiver as trustee.

Private Arrangements

Evan J. Harries, deceased, late chemist and druggist, lately trading at 79, Victoria Street, Dowlais. A meeting of creditors was held recently at Dowlais, when it was reported that a deed of assignment had already been executed in favour of Mr. T. L. Phillips, 36 Union Street, Dowlais. Under the deed the ranking liabilities were set down at £351 against net assets of £115. It was stated that with the concurrence of the bank, who were the mortgagees, it was proposed to offer the stock and fixtures, etc., for sale as a going concern, failing which they would be disposed of by tender. A resolution was passed confirming the deed already executed. The principal creditors are:—Bankers, £180; F. Newbery & Sons, Ltd., £143; Ayrton, Saunders & Co., Ltd., £32; Merthyr Corporation, £27; F. F. Fox & Co., Ltd., £26.

Alex. M. Stewart, 272 Ashton New Road, Manchester, chemist and druggist. At the meeting of creditors a statement of affairs was submitted which showed liabilities of £266 10s. 8d., all due to unsecured creditors. There were also fully secured creditors, who held first and second mortgages to the value of £406. The assets totalled £283 10s. 7d., and comprised cash at bank, 4s. 3d.; stock, £99 8s. 2d.; N.H.I. prescriptions, £33; fixtures and fittings, £5; surplus from securities, £134; and surrender value of life policy, £14 18s. After allowing £18 for preferential claims, the net assets were £265 10s. 7d. It was decided that a deed of assignment should be executed to Mr. A. T. Eaves, C.A., of Messrs. Harry L. Price & Co., 47 Mosley Street, Manchester. The principal creditors are: James Woolley, Sons & Co., Ltd., £96; Westmacott & Son, £71; C. Harrison & Sons, Ltd., £11; C. W. Harper, £10; Place & Co., £24.

Gazette

Bankruptcy Acts

Adjudication

Roberts, T. I., 17a Bridge Road, Blundellsands, Lancaster, chemist.

Pharmaceutical Society of Ireland

Council Meeting

The monthly meeting of the Council of the Pharmaceutical Society of Ireland was held at 67 Lower Mount Street, Dublin, on July 14, Mr. Denis J. Nugent (president) in the chair. The following members of the Council were also present:—Mr. Patrick Brooke Kelly (treasurer), Dr. J. A Mitchell, Sir Thomas Robinson, Messrs. P. J. Fielding, David Warwick, Patrick A. Brady, James McCormack, John Smith, John J. Roche, P. D. Larkin, T. Costelloe, Joseph Gorry, and Joseph F. Costello. Mr. James J. R. Kerr (registrar) was in attendance. Messrs. M. J. Kieran, J. Kieran, and Patrick Liston sent apologies for non-attendance.

Vote of Sympathy

On the motion of Mr. Brooke Kelly, seconded by Mr. Fielding, a vote of sympathy was passed with Mr. J. K. Whelehan, M.P.S.I., on the death of his father, Mr. T. P. Whelehan, M.P.S.I., and with Mr. T. Harper, M.P.S.I., on the death of his brother.

Registration as Pharmaceutical Chemist

Mrs. Mary Costello, L.A.H., who submitted the L.A.H. diploma, was admitted to registration as a pharmaceutical chemist.

Reports from Committees

Reports from the Law Committee, the House Committee, the Schools Committee, the Benevolent Fund Committee, the Poisons Schedule Committee, and the Certificates and Declarations Committee were received and adopted.

Subscribers to Benevolent Fund

On the motion of the President, seconded by Mr. Brooke Kelly, a vote of thanks was passed to donors to the Benevolent Fund.

Changes of Address

The following notified changes of address:—

Mr. James Mangan, Ph.C., to 135 Thoms Street, Dublin; Mr. Francis Doyle, Ph.C., to 12 Upper George's Street, Dun Laoghaire, co. Dublin; Mr. E. J. Broderick, M.P.S.I., to 7 Convent Avenue, Sunday's Well, Cork; Mr. J. J. Cole, T.D., Ph.C., to Nahillah Park, Cleverhill, co. Cavan; Mr. A. O' Shea, Ph.C., to 71 Kenilworth Square, Rathgar, Dublin; Mr. R. A. E. Simmons, Ph.C., to Glen Gormley, Belfast; Mr. T. Campbell, Ph.C., to Clogherney, Brantry, Dungannon, co. Tyrone; Mr. John F. Courtney, Ph.C., to c/o T. J. White, The Pharmacy, Fermanagh Street, Clones, co. Fermanagh; Mr. F. S. Jameson, Ph.C., to The Donegall Pharmacy, 180 Donegall Road, Belfast; Mr. Timothy J. O'Connor, Ph.C., to c/o S. O'Farrell, Ltd., 33 North Strand, Dublin; Mr. W. G. Smith, R.D., to Glencairn, New Road, Donaghadee; Mr. Thomas J. Keatinge, R.D., to 82 West Street, Drogheda, co. Louth; and Mr. Francis E. Smith, R.D., to 4 Albert Terrace, Ashfield Road, Ranelagh, Dublin.

Elections and Nominations

On the motion of the President, seconded by the Vice-President, the following were elected to membership:—

Dr. D. McLoughlin, Ph.C., 3 Lower St. Brigid's Road, Drumcondra, Dublin; Mr. D. F. McCarthy, Ph.C., Offaly Pharmacy, Tullamore, Offaly; Mr. P. A. Brennan, The Medical Hall, Athboy, co. Meath; Mrs. H. Carney, The Pharmacy, Terenure Road, Rathgar, Dublin; Mr. J. K. Whelehan, 38 Pearse Street, Mullingar, co. Westmeath; Dr. H. S. Laird, 5 Nelville Road, Rathgar, Dublin; Mr. P. M. Kavanagh, 1 High Street, Galway; Mr. Daniel McLoughlin, 17 Saville Place, Kennington, London; and Miss I. O'Connor, 8 Ardeevin, Connaught Avenue, Cork.

On the motion of the President, seconded by Mr. Brooke Kelly, the following were nominated for membership:—

Miss Mary J. Rogan, Windy Arbour, Dundrum, co. Dublin; Mr. R. M. Thom, Kimmage Pharmacy, Kimmage, co. Dublin; Mrs. H. C. Mulligan, The Medical Hall, Passage West, co. Cork; Miss Anna Farrington, St. Anne's, Kimmage, Terenure, co. Dublin; Mr. Michael J. O'Rourke, 97 Lower George's Street, Dun Laoghaire; Mr. Francis Doyle, 12 Upper George's Street, Dun Laoghaire; Mr. William T. Hinchy, The Munster Pharmacy, 14 South Main Street, Cork; Miss Genevieve D'Arcy, The Tipperary Pharmacy, Tipperary.

Mr. C. P. Nolan, R.D., 16 South Richmond Street, Dublin, was elected for associate membership.

Proposed Pharmacy Legislation

A deputation consisting of the following members of the Society, waited on the Council for the purpose of making representations in reference to the proposed pharmacy legislation in Saorstat Eireann:—Mr. J. A. O'Rourke, Dun Laoghaire; Mr. C. J. Cremen, Dublin; Mr. John Gleeson, Dublin; Mr. M. J. Parkes, Blackrock; Mr. P. G. Bourke, Dublin; and Mr. Eugene Ronaghan, Dublin. Mr. O'Rourke introduced the deputation.

The President welcomed the deputation. The Council, he said, were very glad to see them, and were glad to hear that the young licentiates were taking such an interest in the Society.

Mr. O'Rourke thanked the Council for receiving the deputation. Speaking, he said, on behalf of many members of the Society, he wished to say that there were proposals in the draft Pharmacy Bill with which they could not agree. The first point they wished to refer to was the omission from the Bill of a clause to exclude from the register persons who sold contraceptives or drugs or articles used for abortion or other criminal purpose. They wished to have incorporated in the Bill —not proposed as an amendment to it—a section stating that it shall be the duty of the Council to remove from the Register the name of any person proved to be engaged in the selling of contraceptives. It would be unfair to the Government and a deliberate shirking of duty and moral obligation for the Council to ask the Government to insert such a clause as an amendment to the Bill. The selling of contraceptives and noxious drugs was infamous conduct. They suggested that the following clause be added to the section dealing with erasure of names from the register:—"The Council shall erase from the register the name of any person manufacturing, stocking, procuring or selling or having in his possession power or control for selling any drug or article used for the purpose of abortion or contraception."

Other members of the deputation referred to various other questions affecting pharmacy.

The President said the deputation had brought very serious suggestions before the Council, and he did not think the deputation would ask the Council to discuss them right away. If the deputation would send them those suggestions in writing the Council would discuss them.

Mr. O'Rourke said he would like to have a definite answer now in reference to the proposal concerning contraceptives and abortifacients.

The President said the Council had discussed this before the deputation came in and the Council had agreed to it.

Mr. O'Rourke: Thank you very much indeed.

The President said the Council would read the suggestions of the deputation very carefully and would see the deputation again.

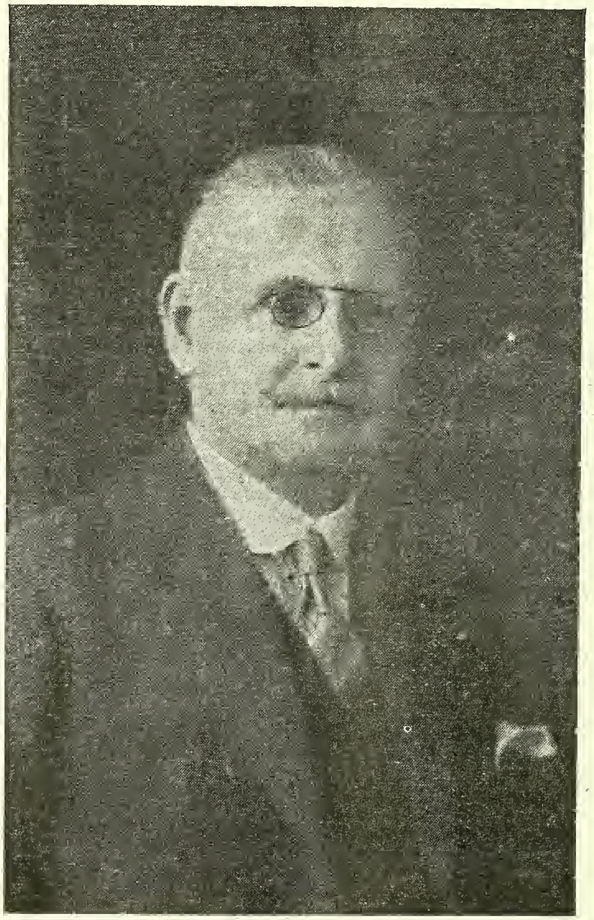
It is understood that there will be tabled for consideration by the Council at its next meeting a clause dealing with the subject of contraceptives and abortifacients.

BRITISH PHARMACEUTICAL CONFERENCE

The Chairman's Address

MANCHESTER MEN OF SCIENCE

IN these days of depression a consideration of the achievements of the past may help to restore confidence when we find how our predecessors triumphed over difficulties greater than ours. When things are going well we think only of the present, and work so hard taking advantage of it that the difficulties and triumphs are forgotten. For Manchester people history has some specially wonderful stories to tell, particularly in the history of science. Manchester's contribution to science has been so great that one wonders why so little local pride and faith are shown in it; if such local talent existed in the past it probably exists in equal quantity now. Why not search for it, and trust to local scientific ability to solve the pressing problems of the day, familiar to every Manchester and Lancashire man? Science and research are most useful in bad times, and now it is imperative that the resources of science are not neglected. Science may not be able to offer a solution of our problems, but no complete solution can be effected which does not include the application of the assistance that science can give. The excessive modesty of Mancunians, or, at least, their lack of intellectual self-confidence, was exhibited as long ago as 1640, when they did not persevere with their petition for the foundation of a University in Manchester. Through Henry Fairfax, the Long Parliament was asked to grant a charter for a Northern University, since "the like hath not been in England (if Cambridge be the last) not of two thousand years." Manchester evidently felt the need of culture from early times, but she did not succeed in obtaining her own University until 1880. Her career as the host of students of science dated from the foundation of her Literary and Philosophical Society in 1781, so that we are celebrating its hundred and fiftieth anniversary this year.



MR. J. H. FRANKLIN, PH.C.
Chairman of the British Pharmaceutical Conference, 1931–32

Thomas Percival

This Society evolved out of meetings in the house of a physician, Dr. Thomas Percival. Percival had been educated at the Warrington Academy, founded to educate Unitarians, Presbyterians, and others excluded at that time on religious grounds from the ancient Universities of Oxford and Cambridge. The famous Joseph Priestley, whose name is inseparably linked with the discovery of oxygen, ammonia, oxides of nitrogen, the transpiration of plants, and many other scientific discoveries, first became interested in science when on the staff of the Warrington Academy. Percival was a man of charming manners and conversation, which enabled him to make friends of distinguished persons he happened to meet, and to continue the friendship through correspondence. He corresponded with Benjamin Franklin; he met the celebrated David Hume in Paris, Madame Neckar, Lord Willoughby de Parham, and other talented and influential persons. Though his social gifts were greater than his scientific talents, he published many papers, some of interesting descriptive value. In his essay on "The State of the Population in Manchester and other Adjacent Places," he describes the rapid increase of Manchester since 1765, and how the population had increased by six times since 1700. He observed that half the children born in Manchester at that time died under five years of age. Diseases were most frequent in January, February and March. The quantity of rain at Manchester was 33 inches per annum (it is alleged to have increased since!). He noted that men die earlier than women, and that great towns are peculiarly fatal to children, for their confinement in impure air "debarred from the free use of their limbs, cuts them off early in life." He discovered that the love of money stifles the feelings, and achieved his finest eloquence in a passage every schoolboy must undoubtedly endorse: "Almost as soon as a boy has acquired the power of speech, he is shut up many hours a day in a noisome school, secluded from the benefits of exercise and the refreshment of the open air, and tied down to the severe drudgery of learning, what seems only, at such a period of life, to overcharge his memory, and to destroy his native cheerfulness of disposition." Of Dr. Percival's many other remarkable observations, we may only mention that he found Birmingham had more public houses than Manchester. A man of some wealth, culture, social interests and personality, he was excellently fitted to be one of the first presidents of the Manchester Literary and Philosophical Society. His activity had helped to make Manchester noticeable as a centre where science flourished, and was a contributory cause of the greatest event in the history of science in Manchester. To stimulate the carrying out of investigations and the reading of papers on philosophy, the Society in 1785 instituted a silver medal.

The first award was made to William Henry, the son of Thomas Henry, an apothecary of the town, for a paper on "Controversies on the Phlogistic Processes." After graduation as a physician in Edinburgh, Dr. Henry returned to Manchester, but ill health interrupted his practice, and he devoted his time to chemical research, especially on the solubility of gases in water under various conditions of temperature and pressure. The well-known "Henry's law" was the direct result of this. Its application to the manufacture of aerated waters by the firm with which he was associated is an example of the linking of theory and practice, which was such a feature of Manchester at that period. Henry's Calcined Magnesia, a product of the same firm, which still carries on business in the city, is well known to-day. The "phlogiston theory" had not long been overthrown by the introduction of quantitative measurements in chemical investigations when there arrived in Manchester a great genius, who later collaborated with Henry, and whose investigations were so fruitful.

John Dalton

In the years preceding 1793 we had a number of workers struggling in the darkness for scientific light and truth, but in that year there appeared amongst them a great philosopher, a star of the first magnitude, a young man who had been born of a Quaker weaver in Cumberland, John Dalton. By the tutoring of Quaker teachers and his own determination he had learned enough in the isolation of Cumberland to open a school at the age of twelve in his native village of Eaglesfield. At the age of fifteen he set off for Kendal to open a school there in collaboration with his cousin. Dalton left home with an umbrella in one hand and a bundle of clothes in the other, to walk the forty-four miles to his new situation. With his cousin he undertook to teach English, Latin, Greek, French, writing, arithmetic, merchants' accounts, geometry, trigonometry, navigation, geography, mensuration, surveying, gauging, algebra, fluxions, conic sections, astronomy, projections, dialling, optics, mechanics, pneumatics, hydrostatics, hydraulics, at, we need hardly add, "reasonable terms." They had sixty boy and girl students, and led a very secluded life. They spoke with a strong Cumberland accent, and were ungainly in manner, John being preferred by the pupils, as he was liable to have fits of abstraction and to overlook petty misdemeanours. While teaching at Kendal, Dalton used to work on the scientific problems set in magazines, a fashionable diversion of the day. In 1787 he won a prize for solving thirteen out of fifteen such problems in the "Ladies' and Gentlemen's Diary," and on March 24 of that year made the first entry in his meteorological journal, the first of 200,000 subsequently made, and perhaps the beginning of his serious scientific work. It was a description of an auroral display. From his meteorological investigations Dalton received the impetus to study the nature of gases such as air, water-vapour, and the fluids whose behaviour inspired him to evolve the atomic theory of chemistry. In measuring rainfall, temperature, and barometric pressure he learned to study natural phenomena quantitatively. His capacity for observation and measurement provided the data out of which his imaginative intellect created the theory immortally connected with his name.

When Dalton arrived in Manchester in 1793 he had six years' continuous meteorological observation behind him, and the experimental experience of having made his own apparatus. He was of remarkably abstemious and determined disposition. His first appointment was in Manchester New College, an offshoot of the Warrington Academy and parent of Manchester College, Oxford. His salary was £80 for the session, with £27 10s. deducted for board and lodging, so he had £1 a week for his other wants. He writes in 1794: "When thou considerest me in my private apartments, undisturbed, having a good fire, and a philosophical apparatus around me, thou wilt be able to form an opinion whether I spend my time in slothful inactivity of body and mind." Dalton brought with him his "hortus siccus" of plants collected in the district of Kendal. Their labelling and description in Latin is an example to aspiring pharmacists of what can be attained as an herbarium. After six industrious years he resigned from the College and supported himself ever afterwards by teaching private pupils at two shillings an hour and by giving lectures. He also wrote books, including "The Elements of English Grammar," to supplement his income. In 1826, at the height of his fame, he was visited by the French savant, Pelletier, whose name is intimately connected with the isolation of alkaloids (quinine, strychnine, brucine, etc.), who came all the way to Manchester to pay his respects to the city's greatest adopted son. Pelletier was astonished to find that scarcely anyone seemed to have heard of him, and only after diligent search did he discover Dalton in a small room in a back-street house, looking over the shoulder of a small boy doing sums on a slate. "Have I the honour to address Mr. Dalton?" the Frenchman asked. "Yes," said Dalton, "Wilt thou sit down whilst I put this lad right about his arithmetic?" At first such a story sounds amusing, but in fact it is really tragic. The failure to support the genius of Dalton appropriately is one only of the symptoms of the disaster which allowed science developed in England to be exploited abroad. Perhaps if his contemporaries had been prouder of Dalton the chemical industry would never have fallen into the Continental hands from which it is now so hard to wrest it. However, Dalton soon received intellectual recognition. In 1794 he was elected to the Literary and Philosophical Society on the proposal of Dr. Henry, Dr. Percival and Mr. Robert Owen, the famous social reformer. In 1800 he became the secretary, and was president from 1817 until he died in 1844.

IMPORTANT DISCOVERIES

By 1800 Dalton had remade several important discoveries and made some new ones of his own. As an independent self-educated man he was far from being well-read in the works of others. He was unaware that others before him had pointed out the connection between aurora and the magnetic needle, the explanation of the trade winds, and several other phenomena. He proved by very simple experiments that water conducts heat, though badly. In 1800 he measured the heat and cold produced when air is compressed and expanded, foreshadowing the discovery of the relation between heat and work subsequently elucidated by his pupil Joule. He had no doubt that all gases could be liquefied by sufficient cooling and pressure, so that later discoveries of the liquefaction of air would have come as no surprise to him. His first studies of evaporation led him to the view that the "evaporation and the condensation of vapour in the atmosphere are not the effect of chemical affinities, but that aqueous vapour always exists as a fluid *sui generis,* diffused amongst the rest of the aerial fluids." The clear perception of this fact later helped him to imagine what the atomic constitution of gases was like, and is expressed as "Dalton's law of vapours." Dalton was the first to prove for certain that rain is due solely to fall in temperature. He spent his holidays in the Lake District, climbing the mountains with apparatus in his pocket, in order to discover whether the composition of air at great heights and low pressures was different from that at sea-level. At the age of twenty-six Dalton discovered he was colour-blind. His investigation of his peculiarity was the first scientific study of the condition. It is interesting to reflect that even so acute an observer as Dalton did not notice his defect until he was twenty-six, and that colour-blind persons had for centuries lived their lives without discovering their condition. The story goes that he bought some silk stockings for his mother, under the impression that they were a dark-bluish drab. His staid Quaker mother was shocked to observe their brilliant hue. "Thou hast bought me a pair of grand hose, John, but what made thee fancy such a bright colour? Why, I can never show myself at meeting in them." From that occasion Dalton studied his vision and developed a theory of colour-blindness. The subject later became very important from the use of coloured signal lights on railways, and led to legislation to prevent men suffering from colour-blindness from becoming engine-drivers. His first paper to the Literary and Philosophical Society was on colour-blindness, and a test for this defect was suggested for insertion in the 1930 Road Transport Act.

The germs of his atomic theory are appearing in his papers of 1802 and 1803. He showed that "oxygen may combine with a certain portion of nitrous gas, or with twice that portion, but with no intermediate quantity." Here we see unit quantities of nitrous gas are implied, which can be taken singly or in double portions. Then his study of the solution of air in water showed that the nitrogen and oxygen dissolve independently. He imagined the particles of each gas as secreted amongst, but not combined with, the particles of the water: "the particles of gas retained their elasticity or repulsive power amongst their own particles, just the same in the water as out of it, the water having no other influence in this respect than a mere vacuum, and no other gas with which the first one is mixed having any permanent influence in this respect." Dalton's reflections and experiments on the nature of gases caused him to determine "the relative weights of the ultimate particles of gaseous and other bodies." Though his researches had pointed in the direction of supposing that each pure substance consisted of particles of definite and uniform weight, and that the ultimate particles of each different substance had different weights, they could not be held to have completely established this principle, upon which modern chemistry rests.

THE ATOMIC THEORY

Out of the darkness of many surmises, Dalton's imagination saw beyond the limits of present illumination; he stated the exact truth on incomplete evidence, which is the mark of scientific genius. In the "Memoirs of the Literary and Philosophical Society" for November 1805, Dalton published a table of the relative weights of the ultimate particles of hydrogen, oxygen, water and other common substances. Having at last some simple quantitative conceptions, chemists could express their reactions in simple quantitative terms; they could express what happened in any chemical reaction, because they knew the proportions in which the substances must react. In some of his lecture notes Dalton tabulates the following points:—That elastic fluids exhibit matter in extreme division; hydrogen and oxygen cannot be decomposed by electricity, while compound gases can; metals, by combining with gases, show that they have atoms, etc. In his laboratory note-book for September 6, 1803, Dalton uses symbols for the atoms of oxygen, hydrogen, carbon, etc., for the first time. His establishment of the theory that the ultimate particles of each substance are uniform in weight, and that the ultimate particles of different substances are fixed in relative weight, together with the invention of chemical symbolism, were the clues to the extraordinary maze of phenomena which chemistry presented to its students a century ago. Chemistry then was like biology now, apparently so mixed and complicated that it had no simple laws. The Dalton of biology has not yet been born, but when he is, the vast confusion of vital phenomena will doubtless suddenly become understood in a way which would be as marvellous to us to-day as in 1805 Dalton's theories were marvellous to his generation. It is sad to relate that the body of Dalton—a man of noble heart and mind—could not be buried in the cathedral precincts because he had not been baptised. However, we pharmacists may be proud of the fact that he was elected an honorary member of the Pharmaceutical Society of Great Britain on its formation.

W. Sturgeon

Before considering the work of another immense genius, one may mention, in passing, such a Manchester scientist as Sturgeon. He was the son of an idle cobbler with a taste for poaching. He had to work to support his father instead of educating himself, much less being educated. Later he became a private soldier. Like the famous William Cobbett, he succeeded in learning much, in spite of all the handicaps of a soldier's life. A terrific thunderstorm during artillery practice inspired him to try to learn the nature of this electrical phenomenon. He taught himself mathematics, Latin, Greek, French, German and Italian well enough to understand the writings of the Continental philosophers, and particularly studied electricity and magnetism, which "had ever the greatest charm for him." In the course of his strenuous and difficult life Sturgeon invented the commutator, which made direct current electrical engineering possible. He invented the soft iron core electro-magnet, which, among many other things, made the electric telegraph possible. He invented the method of amalgamating the zinc plates of batteries to prevent the wastage of zinc. He discovered that alloys of certain non-magnetic metals were capable of being magnetised, and many other remarkable facts. For inventing the commutator, without which there would have been no Metropolitan-Vickers Works in Manchester, or, indeed, any electro-motive engineering, he received a prize of thirty guineas from the Royal Society of Arts. In his old age, being unable to make a living out of casual lecturing, his friends succeeded, after great effort, in obtaining a Government pension for him of £50 per annum. One year and a quarter later he died, and his wife and daughter were left destitute. Such was the end of a man whose work will bear comparison with any in its effect on civilisation. The appalling spirit which refrained from cherishing his genius still persists, and is the source of that refusal to bring the scientific attitude into industrial affairs which is now having such serious consequences.

James Prescott Joule

The name which stands beside Dalton's in the history of science in Manchester is that of James Prescott Joule. He was a child in a wealthy family of brewers in Salford. Wealth and delicate health caused his youth and education to be unusually carefully fostered. He was privately tutored, and as a boy learned a number of electrical tricks and experiments. At the age of sixteen he was sent to study chemistry under John Dalton for two periods of one hour each week. Shortly afterwards Dalton had a stroke, and could not continue the instruction, but Joule had already had the opportunity of close contact with the great genius. He was enabled directly to see how valuable independence in natural philosophy could be, how much could be done with the simplest apparatus such as Dalton used, and the value of quantitative study of all natural phenomena. Joule's gift of manipulative skill was directly connected to suitable objects of study. If he had not met Dalton he might quite well have expended his wonderful skill on the manufacture of fishing flies, mechanical toys, and other suitable but undistinguished pastimes. In 1838, when he was twenty years of age, Joule was given a laboratory in his home by his father. How fortunate and delightful that his father sympathised and encouraged his son's interest; how different from the experience of Sturgeon! His first research, commenced in 1838, was to improve Sturgeon's electro-magnetic motor. He foresaw the development of electric traction in the future. He was somewhat ignorant of what the natural philosophers had written on electricity, and was more familiar with the ideas of the practical engineers amongst whom he lived. He naturally acquired their notion of the work done by machines, and always thought of mechanical contrivances as doing work. He was from the beginning, therefore, prepared to be interested in the output of work by engines.

In his attempts to improve the design of electric motors he naturally measured the amount of work a motor of a particular design would do when a certain amount of electric current was run into it. For instance, of one motor he says it will raise 15 lb. one foot in a minute, if it is connected to forty-eight Wollaston four-inch plate electric batteries. He was already beginning to use the notion of the equivalence of mechanical work and expenditure of electrical energy; how much electricity is needed to do a certain amount of work. This question was buried in his very first researches, and the reference just given is the first recorded absolute measurement of work in the history of physics. In 1839 he made a delicate galvanometer, to measure exactly how much electricity he was putting into his motors. This search for improvement in the efficiency of electric motors had caused him to make a galvanometer more sensitive than any constructed before. As a detail, he discovered the law that "the attractive force of two electro-magnets for one another is as the square of the product of the current, and the length of the wire." In 1840 he accurately measured the current used by his motor, the resistance and velocity of the machine, and the consumption of zinc in the batteries driving it, so that he obtained the work done per pound of zinc consumed. While he was making these remarkable experiments, it is interesting to observe that Joule was trying to solve the problem of perpetual motion. His ignorance of mechanics was such that he did not appreciate that the methods he was trying to use to improve the efficiency of electric motors implied that perpetual motion was possible. He was attempting to reduce resistances in the motors which followed naturally from mechanical laws. He discovered the exact equivalence of electrical and mechanical work as an incidental detail from the measurements he made, to find whether his new designs of electric motors were more efficient than the old, and whether he had succeeded in reducing irreducible resistances in them!

AN ELECTRICAL UNIT

During the course of these experiments Joule was led to invent an absolute unit of measurement for electricity. Using Faraday's electrolytic discovery that a fixed quantity of electricity is required to deposit a unit quantity of silver, or any other elementary substance, Joule suggested that "a degree of static electricity is that quantity which is just able to decompose nine grains of water. A degree of current electricity is the same amount propagated during each hour of time." Previously, experimenters had used arbitrary units, which added to the confusion of the results of their experiments, and Joule's invention of an absolute unit of electrical energy was an important simplification, which made the significance of researches more immediately obvious. In 1843 he commenced to investigate the origin of heat in electro-magnetic machines. He set out to discover whether the electricity generated the heat in the motor's armature, or whether the armature merely became hot by transference of heat from the surrounding field-magnets. By surrounding the machines with water tanks and measuring the rise in temperature of the water while the machine was running, he demonstrated that the electricity generated heat in the coils of the machine. This discovery was quite revolutionary, since physicists had previously believed that heat was a fluid called "caloric," which flowed from cold to hot places. They supposed that the heating of the coils of the motor was due not directly to the electricity, but to the flow of caloric, under the impulsion of electricity. Further, Joule's demonstration that electricity can be converted into heat led him to measure exactly how much heat is produced by a unit quantity of electricity. In these experiments he was measuring temperature changes of one-twentieth of a degree Fahrenheit to a considerable degree of accuracy—a great advance in thermometric technique.

JOULE'S THEORY OF HEAT

From his experiments on the equivalence of heat and electricity, the step to the determination of the equivalence between heat and mechanical work was not long. He had only to compare how much mechanical work was required to drive his electro-magnetic machines and then compare the amount of work given out by the machine, *plus* the heat generated in it. By simple calculation the equivalent of mechanical work in heat was easily determined. As the result of his first thirteen experiments he found that the "quantity of heat capable of increasing the temperature of a pound of water one degree Fahrenheit is equal to and may be converted into a mechanical force, capable of raising 838 lb. to a perpendicular height of one foot." Joule established his equivalence of work and heat through determining the equivalence of electrical, mechanical and chemical energy. He did not go straight to the establishment of the equivalence between heat and mechanical work. By examining all the other manifestations of work he made his general equivalence immensely more pregnant, for it implied not merely the equivalence of mechanical work and heat, but the equivalence and convertibility of all forms of energy. By the variety of his experiments he showed that all changes in nature were based on changes in one entity only, energy. Chemical, electrical, mechanical, and heat action were merely different manifestations of the same thing. Joule had discovered the great unifying idea which runs through the whole of modern physics. What an achievement! He was twenty-five years old when he published it in 1843. He had researched privately for five years only, and was still comparatively ignorant of mathematics and theoretical mechanics. His ignorance caused him to make some quite simple errors, such as trying to produce what implied perpetual motion.

These lacunæ in his papers prevented immediate acceptance of his discovery, and his account of his researches to the British Association in 1843 was received in silence. At the Oxford meeting of 1847 he was requested to restrict his remarks to twenty minutes. As no discussion was invited on his paper the section was about to pass on to the next business when a brilliant and already famous young student from Cambridge rose and explained how pregnant were the results of Joule's researches. William Thomson, afterwards Lord Kelvin, having already as a youth an immense reputation, was able to draw some attention to Joule's work, and from that date it began to be appreciated. Apart from some slight theoretical errors in his papers, Joule's experimental results were of a higher degree of accuracy than anything of the kind before. He argued the most important philosophical consequences from differences of small fractions of a degree of temperature. Many distinguished physicists simply refused to believe that the small temperature changes Joule measured with such confidence could be significant. They were assuming, of course, that Joule's standard of experimental skill was no higher than their own. Nevertheless, with powerful followers such as Thomson, Joule's work was recognised sufficiently for him to be elected to the Royal Society in 1850, at the early age of thirty-one. Though recognition was not instantaneous, it came pretty quickly. From 1850 onwards he made many useful researches, but none of the outstanding original quality of his youth, between the ages of twenty and twenty-five. Among other discoveries he proved that an absolute zero of temperature could be estimated from the behaviour of gases, and he gave an explanation of the nature of shooting stars. His mechanical equivalence of heat enabled him to explain why a body moving against cold air should become hot, in apparent contradiction to the principle popularly applied when porridge is cooled by blowing on it. He redetermined the mechnical equivalent of heat with greater accuracy, and collaborated with Thomson on experiments on the expansion and diffusion of gases. In later years his intellect lost the edge observable in his early writings, whose tenseness of thought and expression are inspiring to all students of physics, and his old age was as clouded as his youth had been fortunate.

Research at Owens College

Dr. Henry Wilde, who, by his generous endowments, provided for the upkeep and extension of our great Literary and Philosophical Society, invented the modern dynamo, which yielded currents of strength undreamt of, thus paving the way for later developments. He also invented and took out patents for searchlights, etc., and the wealth gained by these discoveries was distributed to other scientific bodies and universities. Sir Edward Frankland, apprenticed to a druggist at Lancaster, was the first Professor of Chemistry at Owens College. Although he only worked here for six years, this period was noted for the great output of work and brilliant research, and it is clear that, owing to his studies and sound arguments on the character of uniting atoms, we obtained the first conception of valency.

Passing from the great independents, Dalton and Joule, we think next of Sir Henry E. Roscoe, for he in a different way was a comparable figure. He had not the genius of Dalton and Joule for purely scientific work, but he had a conception of the social value of science which made him of great value to the culture of his day. Roscoe was a personality interested in science and aware of its social importance in modern life. He used his personality at great sacrifice to his scientific attainments to graft science into the life and industry of Manchester. He foresaw that the future of Manchester depended on the application of science, and strove therefore to make Manchester one of the leading schools of science in the world, and more than the fortuitous home of solitary geniuses such as Dalton and Joule. Roscoe's ideas naturally expressed themselves through the development of Owens College, and the establishment there of what, at the time, were the best chemical laboratories in England. He had studied under Bunsen and had the means and leisure to visit many Continental laboratories, so that when the chemical department at Owens College was ripe to be extended, Roscoe not only knew how to make it equal to the best in the world, but succeeded in going one better. He brought Schorlemmer to direct the work on organic chemistry, so Manchester immediately had excellent equipment and entirely modern teaching Roscoe's own researches, though not of the first order, were in the line of progress. Under Bunsen's influence he continued the study of the effect of light on chemical reactions, and followed this with a long investigation on the properties of vanadium, the metal now so important in the production of special alloy steels for motor-car manufacture. Schorlemmer made classical researches on the constitution of hydrocarbons, and successfully combated the views of Frankland on the so-called alcohol radicals.

Modern Developments in Chemistry and Physics

The achievements of the successors of Roscoe and Schorlemmer, such as W. H. Perkin, H. B. Dixon, and such living chemists as Professor Lapworth and Professor Robinson are well known. Perkin seized the opportunity to develop organic chemical investigation to such an extent that in a few years his department had gained recognition as a school of research almost greater than any other in the world, and his own investigations on the constitution and synthesis of alkaloids and other natural products such as hæmatoxylin, camphor, terpenes, etc., are classics in organic synthesis. Dixon founded a school of research on combustion, which has developed in many directions, in the investigation of problems so practical as coal-mine explosions, and the nature of the changes in the cylinders of internal combustion engines. From researches initiated by him the future expects remarkable applications, both in the saving of human life and in the improvement of engines. The researches of Lapworth and Robinson are doubtless better known to many of my audience than to myself, but I may mention their contributions in the domain of organic chemistry and Robinson's studies in the constitution of natural alkaloids: researches of great interest for the light they throw on the nature of chemical processes in living organisms.

Modern Manchester has been equally distinguished in the study of physics. The name of Sir Arthur Schuster will be familiar to all. Besides his great influence as a teacher, he made many researches in optics, and it is not generally known that he very nearly preceded Sir J. J. Thomson in the discovery of the electron. His successor was even more eminent, none other than Lord Rutherford, O.M. During his researches betwen 1907 and 1912, Rutherford deduced from his experiments that conception of the atom which did for modern physics what Dalton's atomic theory did for chemistry. His sublimely simple experiments demonstrated that the atom consists of a tiny nucleus with electrons revolving round it. He was assisted by C. G. Darwin, a grandson of Charles Darwin, and by no less a person than Niels Bohr, the young Danish physicist, who had been drawn to Manchester by Rutherford's fame. Later the Dane was to define how the quantum theory could be combined with Rutherford's conception of the atom, so that innumerable unco-ordinated facts and whole branches of previously obscure investigation, such as spectroscopy, suddenly became transparent in order and structure.

H. G. J. Moseley

In those wonderful years for Manchester physics just before the war there was H. G. J. Moseley, who brilliantly applied the newly invented method of analysis by x-rays to demonstrate that all the common atoms have simple numerical relationships, suggesting that they are merely different combinations of one or two fundamental entities, probably positive and negative electricity. In Rutherford's laboratory he at once gave evidence of unusual ability, both as an original thinker and skilful experimenter. The researches with which his name is especially associated were those made shortly before his death. Rutherford had announced the nuclear theory of atomic structure, which required each atom to consist of a minute positively charged nucleus, about which negative electrons were distributed. It seemed also that the charge would increase with the atomic weight of the element. It had been suggested, and Bohr had adopted this view, that the nuclear charge was equal to the atomic number, i.e., to the number of the element in a complete series of the elements arranged in ascending order, but hitherto no atomic property had been discovered that could be definitely represented by this number. Moseley, shortly after the discovery of the diffraction of *x*-rays by crystals, set to work to examine the *x*-ray spectrum of a number of elements, each of which he made in turn the target of an *x*-ray tube. He found that his crystal grating gave a spectrum of lines for each element, and their frequency increased by similar steps as he passed from one element to the next; indeed, the frequency of vibration associated with each element was a simple function of a number which he found to be identical with the atomic number. It is now generally accepted that this number, experimentally determined by Moseley for a number of elements, defines the chemical and physical properties of the particular element. Moseley was able to indicate the number of elements yet to be discovered, and he cleared up the anomalies in the periodic tables of the elements that had been the despair of chemists for nearly half a century. Accepting a commission in the Royal Engineers, he was sent to the Gallipoli Peninsula, where he was killed by a Turkish bullet on August 10, 1915. By his untimely death we lost one of the most brilliant minds of the century.

When the war was over Rutherford recommenced his experiments, in which he disintegrated the atom, and here we have a most remarkable coincidence, as this epoch-making discovery was announced to the world in the very house in which John Dalton propounded his atomic theory. Shortly afterwards Rutherford left Manchester to become the Cavendish Professor of Experimental Physics at Cambridge, and we lost one of the glories of world science. Without him Einstein might not have developed his theory. He was succeeded by W. L. Bragg, who shared the Nobel Prize with his father at the age of twenty-five, and invented one of the fundamental methods of conducting the analysis of crystals by *x*-rays. Lately, Bragg has solved the intricate problems of the constitution of silicates, and continues to uphold the fame of the Manchester School of Physics.

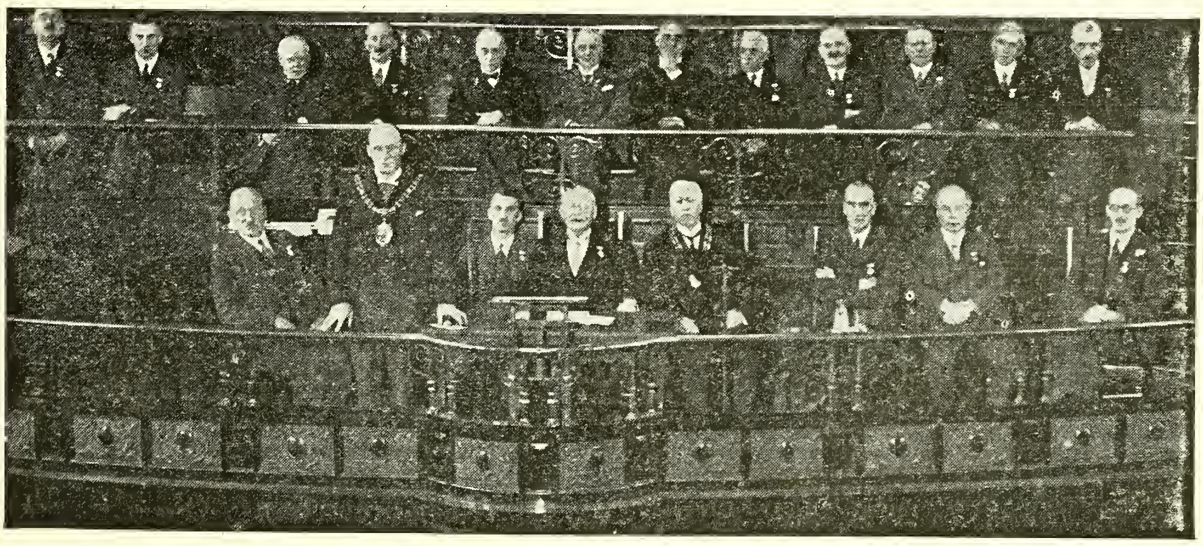
Other Sciences

Time does not permit a review of Manchester's labours in the other sciences. One may mention in passing the name of Horace Lamb, whose research and teaching of applied mathematics have had such a wide influence. There was Osborne Reynolds, who did so much to improve the scientific aspects of engineering. And then there are Manchester's old students. Sir J. J. Thomson, O.M., the great revealer, the father of modern physics and discoverer of the electron, is a native of Manchester, and was a student of Owens College at a very early age, before he went to Cambridge. He is noted for the imaginative range of his hypotheses and his wonderful skill in experimental physics. He discovered that the atom is not, as its name implies, indivisible, and much of our later knowledge of the structure of the atom is due to his investigations. Sir Arthur Eddington, D.Sc., F.R.S., like Dalton, came to Manchester from Kendal, and also, like him, was of Quaker descent, and is the greatest English authority on that important and evasive subject, relativity. From a scholarship at our University he now possesses the honorary fellowship of ten foreign academies. Manchester, in the history of science, is exceedingly illustrious. She has made immense contributions to the theory of the nature of matter unapproached by any other centre, her fame being better known in many foreign centres of learning than it is here, and it is necessary to remind Mancunians of this fact, so that her sons may continue to equal in the future the achievements of her past.

But, when all is said, whatever is done, we turn to our first love, John Dalton, who provides us with one of the greatest examples in history of classical research and discovery by a private person who had no resource save that of genius. The great scientist, Sir Arthur Eddington, who was born in the Friends' School House in which John Dalton taught in Strammongate, Kendal, called Dalton "the greatest of all chemists," and why? Because he did so much with so little.

* * *

THE PLATFORM AT THE OPENING SESSION



Front row (left to right): Councillor R. G. Edwards, the Lord Mayor of Manchester, Mr. C. E. Corfield, the Chairman (Mr. J. H. Franklin), the President (Mr. A. R. Melhuish), Mr. C. A. Hill, Mr. F. W. Gamble, Mr. E. H. Simmons.

Trade Notes

The Pepsodent Co., 8 India Street, London, E.C.3, inform us that Mr. R. Faulkner has taken over the duties of manager of the Sales and Professional Departments.

Veet.—Dae Health Laboratories, Ltd., Cunard Road, Chase Estate, London, N.W.10, announce a special bonus offer of new white Veet. Full particulars will be found in our advertisement pages.

Reade's Express powders.—Reade Brothers & Co., Ltd., Wolverhampton, draw attention in our advertisement pages to Reade's Express powders and give particulars of revised prices and pack.

An attractive display screen is perhaps one of the most useful aids to efficient window-dressing. The example illustrated herewith, a product of Coty (England), Ltd., Coty House, 3 Stratford Place, London, W.1, is of a size suitable for most chemists' windows, and in design is up to the usual high Coty standard.

The centrepiece is a bouquet of flowers reproduced in delicate colours, while on the panels are particulars of Coty flower perfumes. Use of the screen, neatly arranged with an assortment of appropriate preparations, will not only form an attractive display, but will, without doubt, give an impetus to business.

Eau Dixor.—Debacq & Harrop, 68 Newman Street, Oxford Street, London, W.1, announce a new size of Eau Dixor liquid hair remover. An extensive advertising campaign is starting immediately.

Dorian Trading Co., Ltd., 121 High Street, Notting Hill Gate, London, W.11, call attention, elsewhere in this issue, to Dorian safety razor blades, a British product retailing at an attractive price.

Wright's coal tar soap.—Wright, Layman & Umney, Ltd., manufacturing chemists, 44 Southwark Street, London, S.E.1, announce a special window display offer of Wright's Coal Tar soap.

Urodonal.—Spencer & Co., 20 Queen Street, Hammersmith, London, W., call attention to national advertising in progress for Urodonal. Effective display cards and literature will be supplied free with first order.

Cornol corn remover.—Thompson & Capper Wholesale, Ltd., Manesty Buildings, College Lane, Liverpool, draw attention to a bonus offer, particulars of which will be found in our advertisement pages, of Cornol corn remover. Attractive advertising matter is offered free.

Annual holidays.—The works of W. R. Tilbury & Son, toilet brush manufacturers, 47 Frampton Park Road, Hackney, London, E.9, will be closed for the annual holidays from August 1 and will be reopened on August 10. Telephone inquiries will be attended to.

The comprehensive range of showcards produced by Dubarry et Cie, Goldstone Laboratories, Hove, has been further augmented by the addition of an attractive cut-out printed in silver and colours to be used in displays of Dubarry's Powdrette. The card, which measures 10 x 14 ins., is illustrated elsewhere in this issue.

Lever Brothers, Ltd., Levitas House, Finsbury Square, London, E.C.2, have sent us a copy of a beautifully printed and illustrated descriptive brochure entitled "The Story of Port Sunlight." The booklet is designed for distribution to visitors and to answer the many inquiries from all over the world about Port Sunlight.

Amateur photographers may be divided, perhaps, into two classes—those whose activity ceases when the shutter closes and the keener exponents of the art whose interest attaches equally to the exposure and the chemical processes following. It is to assist chemists to cater for the latter class, usually profitable customers, that Johnson & Sons Manufacturing Chemists Ltd., Hendon Way, Hendon, London, N.W.4, have produced a special set of chemicals in the form of a bonus box, particulars of which will be found in our advertising pages. Messrs. Johnson have sent us details of an interesting toning competition, and offer to supply explanatory leaflets (for counter distribution) to any of our readers on request. Attractive cash prizes are offered and the competition is open to all amateur photographers.

Trade-Mark Applications

The figures in parentheses refer to the classes in which the marks are grouped. A list of classes and particulars as to registration are given in "The Chemist and Druggist Diary," 1931, p. 345.

(*From "The Trade Marks Journal," July 1, 1931.*)

"Nutri-Cel"; for medicinal chemicals (3). By Amelia E. Swin-Dell, 118 Southampton Row, London, W.C.1. 523,223.

"Pepsodent Antiseptic" on label design; for medicated antiseptic solutions (3). By The Pepsodent Co., 919 North Michigan Avenue, Chicago, U.S.A. 522,821. (Associated.)

"Beau Geste"; for goods (47) and perfumery, etc. (48). By Cussons, Sons & Co., Ltd., Kersal Vale Works, Moor Lane, Kersal, Manchester. 522,816/817. (Associated.)

"Mirage"; for perfumery, etc. (48). By Parfums Gueldy, Société Anonyme, 82 Rue D'Hauteville, Paris, France. 519,073.

"Midnight" with design; for perfumes, face powders, lotions, and creams (48). By The United Drug Co., Ltd., Rexall Building, Waterway Street, Nottingham, 521,097.

"Eclador"; for all goods (48). By J. Lesquendieu, 5 Bis rue de la Tacherie, Paris, France. 522,646.

"Suncré" with design; for perfumery, etc. (48). By Jeanette D. Brozel, 52 Sheen Road, Richmond, Surrey. 521,895.

"Parhelion"; for perfumery. etc. (48). By L. P. Macdonnell-Green, 20 The Grove, Ealing, Middlesex. 522,066.

"Static"; for tooth brushes (50). By W. R. Speer & Son, 215 Dalston Lane, London, E.8. 523,323.

Application Amendment

According to "The Trade Marks Journal" of July 1, 1931, the specification for "Perisyl" in Class 3, No. 518,201, by The County Chemical Co., Ltd., has been amended to "An intestinal stimulant, being a medicine for human use."

(*From "The Trade Marks Journal," July 8, 1931.*)

"Dupac"; for photographic films (1). By Dupont Pathé Film Manufacturing Corporation, 35 West 45th Street, New York, U.S.A.. 522,888.

Births

Notices for insertion in this column must be properly authenticated.

Miller.—At "Davaar," Dunfermline, on July 20, the wife of Thomas C. Miller, chemist and druggist, of a daughter.

Marriages

Finn—Newson.—On July 20, at Holy Trinity Church, Clapham, Harold Dudley Wotton Finn, M.P.S., son of Mr. and Mrs. F. D. Finn, to Marjorie Kate Newson, M.P.S., daughter of Mr. and Mrs. I. M. Newson.

Hodge—Heard.—At Launceston Wesleyan Church, on July 13, Edmund G. W. Hodge, M.P.S., Exeter Dispensary, to Winifred A. Heard.

Small—Baker.—On July 22, at All Saints' Church, West Southbourne, Bournemouth, Mr. Thomas Bakewell Small, M.P.S., elder son of the late Mr. B. T. Small and Mrs. Small, of West Southbourne, to Dorothy, daughter of Mr. and Mrs. H. Baker, West Southbourne.

Deaths

Elkington.—At Bognor, on July 8, Mr. William Alfred Elkington, chemist and druggist, aged seventy-five.

Typke.—At a nursing home, after an operation on July 17, Mr. Paul George William Typke, F.I.C., F.C.S., chemical manufacturer. Mr. Typke was born in 1856. He first entered business with Williams, Thomas & Dower, of Brentford, and later was connected with Foster & Gregory, of Streatham. In 1883 he founded, in conjunction with the late Walter R. King, the firm of Typke & King, Ltd., of Mitcham Common, manufacturers of fine chemicals, etc.

Wharram.—At The Oaks, Rossington Bridge, near Doncaster, on July 8, William Allan Wharram, aged sixty-one. Mr. Wharram was well known as founder and managing director of W. A. Wharram, Ltd., wholesale and manufacturing chemists, Lady Lane, Leeds. After serving his apprenticeship he qualified at the age of 21, and in 1892 commenced the business bearing his name. His genial personality won him a wide circle of friends, and he will be sadly missed. The funeral took place at Naburn, near York, on July 11. Mr. Wharram leaves a widow and one son.

Personalities

Mr. Thomas Ralph, chemist and druggist, has passed the diploma examination of the Worshipful Company of Spectacle Makers, as well as the supplemental examination for the recognition of abnormal ocular conditions and diseases of the eye; Mr. Ralph will open an optical department to the business of Stephenson & Ralph, Ltd.. chemists, Burnley, of which he is managing director.

Certificates of Naturalisation have been granted to A. Orliansky, medical practitioner, 107 Canfield Gardens, Hampstead, London; I. Smidt (known as Jack Smith), managing director of a drug store, 36 Russell Gardens, Golders Green, Middlesex; B. H. Tarlovsky (known as Barnett Hirsh), medical practitioner, 26 Elizabeth Street, Cheetham, Manchester; Isabella B Wiese, medical practitioner, The Cottage Hospital, Longton, Stoke-on-Trent.

Prescription Problem

The majority of practical dispensers must, we think, regard the Prescription Problem set in our issue of July 4 (p. 9), as an easy one. It brought us a larger response than usual, as we expected, and a large number of correct or approximately correct transcriptions. The prescription reads:—

Lin Terebinth
℥iv

The prescriber's stroke following the "L" is a conventional sign for "in"; we have not differentiated between competitors who thought it was "i," those who took it for "n," and those who wrote "Lin." Those who added a non-existent " . " to one or both words without indicating the addition as their own have stood no chance. Two competitors omitted the quantity, and several misread the first line, either through "examination" nervousness or through supersubtlety. The principal variants are as follows:—

Ac oxal xl
Aq. Goulard.
Kalsel
K[alium] I[odid] rec
*Lin. iodid
*Lin tereb ac
*Lin tereb alb
Lin. tereb. dil.
Lin terebene
Liq. hyd. chlor.
Liq. Izal
L[otio] Goul[a]rd
Tereb rec[t].

The asterisks denote replies sent in by more than one competitor. "Lin tereb ac [et]" was the most popular error, receiving ten votes. After eliminating incorrect replies, the number of correct ones remains so large that priority of posting has to come into play. Postcards giving accurate solutions were received on July 3 or July 4 from the following:—

Mr. C. W. Barnett, 144 Whitworth Road, Rochdale
Mr. P. Chadwick, 2 Polefield Road, Blackley, Manchester
Mr. D. I. F. Evans, c/o Mr. E. H. James, Lampeter
Mr. A. J. Fairlee, 71 Lavender Hill, London, S.W.11
Mr. W. Forster, 30 Church Street, Seaham Harbour
Mr. F. Hartley, 239 Broad Street, Pendleton
Mr. C. Hopton, c/o Mr. L. M. Jones, Hanley, Stoke-on-Trent
Mr. H. B. Lloyd, 418 High Street, Cheltenham
Mr. W. L. Million, Fleet
Mr. J. Moore, Nearmill, Stobs, Hawick
Mr. T. M. Parker, 207 High Road, Wood Green, London, N.22
Mr. E. G. Robinson, c/o Boots, Ltd., 3-5 Middlewood Road, Hillsboro', Sheffield
Mr. R. Robinson, 134 Whitchurch Road, Cardiff
Mr. F. W. Roberts, c/o W. Aston & Co., Ltd., 27 Montague Street, Worthing
Mr. W. P. Walsh, 24 Belsize Park, London, N.W.3
Mr. F. C. Isham Wilson, 24 Commercial Street, Newport, Mon.
Miss C. M. Woodcock, 5 Caister Road, Great Yarmouth

To each of these competitors a prize of 5s. is being sent, and we congratulate them on their keenness.

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The tenth edition of this, the most complete pharmaceutical formulary in the English language, comprises (1) selected formulas from the British, United States, and several other pharmacopœias; (2) unofficial formulas from hospital pharmacopœias and other sources, British, colonial and foreign; (3) known, admitted and approved remedies (218 pages) taken from previous editions of "Pharmaceutical Formulas" and from THE CHEMIST AND DRUGGIST Diaries; (4) concise descriptions of practical methods of manufacture, adapted to the retail shop; (5) an Appendix comprising laws and regulations governing the sale of poisons, the hours of closing, medicine-stamp duty, the use of spirits and many other data —*e.g.*, a solubility table and chart. The volume contains 1146 pages. Price 15s., by post 15s. 9d.

THE ART OF DISPENSING.
The tenth edition was published in 1926. It has been thoroughly revised and considerably improved, while maintaining the features which have made it so popular with several generations of students. All chemists should keep this book in the dispensary for ready reference when difficulties arise in the course of the day's work. Price 8s., by post 8s. 6d.

VETERINARY COUNTER PRACTICE.
Chemists interested in veterinary practice will find it indispensable, as it deals with the ailments of horses, cattle, sheep, pigs, dogs, and poultry, and the remedies that can be supplied. New edition, 1930 (Eighth), brings this book thoroughly up to date. It has been written throughout by experienced veterinary surgeons. Price 7s. 6d. net, by post 8s.

THE PHOTOGRAPHIC CHEMIST.
This is a concise guide to chemists commencing and carrying on a photographic department. The book is a reprint of the treatise in THE CHEMIST AND DRUGGIST DIARY, 1926, with additional chapters and formulas. Price 3s. 6d., by post 3s. 8d.

PHARMACEUTICAL BOTANY.
An attractively written book dealing with the plants mentioned in the examination syllabus of the various pharmaceutical examining bodies. Botanical terms which at first sight are forbidding in appearance are explained so that the meaning is made crystal clear. A useful gift for apprentices and assistants who have not passed the qualifying examinations. Price 5s., by post 5s. 4d.

DISEASES AND REMEDIES.
Now in its sixth edition (March, 1931). It has been carefully revised by an experienced medical practitioner and parts of the book have been rewritten. Price 5s., by post 5s. 3d.

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This department of chemistry is one which those behind the drug counter can profitably cultivate. The object of this book is to give chemists exactly the information they want on the subject. The book is written by a working pharmacist who is expert in the subject, and has been revised by a M.B.Lond. (3rd Edition.) Price 3s. 6d. net, by post 3s. 8d.

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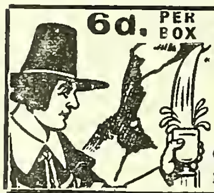

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The
CHEMIST AND DRUGGIST
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The Conference Papers

The Manchester meeting of the British Pharmaceutical Conference has been an outstanding success. The chairman (Mr. J. H. Franklin) chose as the subject of his address "Manchester Men of Science." Mr. Franklin is sure of the thanks of the pharmacists all over the world who will read our report for giving them so arresting a narrative of discovery and invention. The twenty-three papers presented in the Science Section commenced with one on *French Tincture of Iodine* by Mr. J. R. Walmsley, who shows that, on keeping, free iodine is lost to a considerable extent, hydriodic acid and ethyl acetate being formed. *The Determination of Strychnine in Easton's Syrup* has been reinvestigated by Messrs. L. A. Haddock and N. Evers, who have evolved an analytical technique giving, they claim, more accurate results than have hitherto been attained. *The Correlation of Chemical and Toxicity Tests on Mercurochrome* is discussed by Dr. H. A. Mitchell, who arrives at the conclusion that physiological standardisation remains essential, but also finds that chemical examination is necessary. Mr. T. Tusting Cocking contributes a paper on *The Assay of the Official Balsams.* Messrs. P. A. W. Self and C. E. Corfield have drawn up a scheme for *The Assay of the Cinchona Galenicals proposed for the British Pharmacopœia,* a scheme which overcomes emulsification difficulties and yields accurate results. Mr. G. J. W. Ferrey has analysed several samples of *Theophylline Sodium Acetate of Commerce.* He suggests that the anhydrous salt should be therefore made the standard, not more than 5 per cent. of water being sanctioned. *The Quantitative Methylation of Theobromine and Theophylline, and the Determination of these Substances in Theobromine Sodium Salicylate and Theophylline Sodium Acetate* is the subject discussed by Messrs. P. A. W. Self and W. R. Rankin. It is shown that methylation of these substances to caffeine can be made 98 to 99.5 per cent. effective. Messrs. C. E. Corfield and W. R. Rankin, in a study of *The Resin of Ipomœa (Mexican Scammony Root), its Solubility in Ether and the Acid Value as a Test for Resin,* give reasons for their opinion that the test should be retained. *Factors Influencing the Stability of Hypochlorite Solutions* have been investigated by Mr. H. Davis, who has devised a formula for a modified Dakin's solution suitable, he suggests, for inclusion in the Pharmacopœia. *Bismuth Sodium Tartrate and Mistura Bismuthi Composita Acida cum Pepsino* have been studied by Messrs. S. Webster-Jones and A. J. Jones, whose chief object has been to produce a satisfactory mixture. *Pale Cresylic Acid and Lysol* is the subject of a paper by Mr. Norman Glass and Mr. A. J. Jones, who have worked at the question of selecting acids suitable for use in the manufacture of lysol, and, at the same time, of ascertaining the relations between the properties of the cresol and the lysol made from it. The co-ordinated scheme by Messrs. Alan H. Ware and Victor Smith relating to *The Systematic Qualitative Analysis of Vegetable Powders and Extractives* is continued. The paper describes tests enabling an unknown extractive to be assigned to primary groups. *The Volumetric Assay of Lactic Acid B.P.* is discussed by Mr. H. Brindle, who recommends determination in the cold of the total acidity in preference to the process suggested by the Pharmaceutical Chemistry Subcommittee of the Pharmacopœia Commission. The same author has evolved a convenient process for making *Calcii Lactas Recens* at the dispensing counter, giving a solution which contains only a trace of undecomposed lactide. Mr. John Rae contributes a paper in which he gives the results of experiments on *Tinctura Cocci.* The author gives the formula of a tincture of cochineal, made after defatting, which has a much greater tinctorial power than the B.P. preparation. In an elaborate monograph on *Variations in Potency and Total Solids of Tinctures of Digitalis* Mr. F. Wokes shows that the proportion of total extractive in any sample of tincture of digitalis is no guide to its therapeutic value. Messrs. F. Wokes and H. Crocker contribute *Biological and Spectroscopic Tests on Ergot Alkaloids, with Notes on the Maurice Smith Colour Test.* Interesting results are obtained regarding the ultra-violet absorption of solutions of ergot alkaloids, but their differences are insufficient for quantitative application. *The Assay of Drugs Yielding Essential Oils* is dealt with in a highly practical manner by Mr. G. R. A. Short, who has devised a special "flow-back" distillation apparatus. The operation of distilling, receiving oil in solvent, and separation and retention of solvent is continuous. The results accord with distillation conducted on a much larger scale. *The Hydroxy-Acid Complexes of Iron* have been studied by Mr. C. Morton, who finds, for example, that the active principle of "iron and potassium tartrate" is a soluble basic tartrate ($Fe_2(OH)_4C_4H_4O_6$) which is present mainly as true electrolyte in acid solution, but is decomposed to a varying extent to basic hydrosol in alkaline solution. Mr. T. McLachlan has written brief notes on *Syrup of Senna* and *The Dispensing of Syrups in Wet Bottles.* Mr. F. J. Todd contributes *Notes on Mercuric Nitrate Ointment and Liquor Eastoni pro Syrupo.* A changed formula is suggested for each of these preparations, with the object of increasing stability. A study of *Solution of Bismuth and Ammonium Citrate* is furnished by the same author, who discusses the method of manipulation, the initial amount of water to be used, and the solution of the bismuth citrate in ammonia. Finally, Mr. G. Middleton deals with *The Estimation of Moisture by Distillation,* and shows the importance of standardising the conditions of the determination. In "The Social Side" we have attempted to convey some impression of the Lancashire kindliness with which visitors to the Conference have been made to feel at home.

BRITISH PHARMACEUTICAL CONFERENCE

The Proceedings

MANCHESTER chemists have been the hosts of the Conference on two previous occasions. The first was in the year 1887, when one of the extraneous attractions was a Jubilee Exhibition—the Jubilee referred to being, of course, that of Queen Victoria. The Conference met at Owens College, now the Victoria University, and was formally welcomed by the Professor of Materia Medica, Dr. Leech. The president was Mr. S. R. Atkins, of Salisbury; the vice-presidents included Professors Attfield, Bentley and Redwood, Messrs. Brady, Carteighe, Thomas Greenish, Richard Reynolds, Dr. Symes and Mr. G. S. Woolley; the treasurer was Mr. Charles Umney; the general secretaries, Dr. Thresh and Mr. W. A. H. Naylor, and the local secretary, Mr. F. Baden Benger. The opening reception, held at the Grand Hotel, was a crowded function, the attendance (over 200) apparently exceeding expectation; the presidential address was received with applause, "again and again renewed"; but enjoyment of the one excursion, to Matlock Bath, was to some extent marred by rain. The authors of the papers presented included Mr. W. Elborn, of Owens College (who reported on the then somewhat novel subject of strophanthus and on English rhubarb), Mr. F. Ransom (on ipecacuanha), Mr. Thomas Maben (on Blaud's pill), Mr. J. O. Braithwaite (on vesicating beetles), Mr. Peter MacEwan, afterwards Editor of THE CHEMIST AND DRUGGIST (on camphor oil), Mr. William Kirkby (on a spurious cubeb), Mr. D. B. Dott (on morphine derivatives), Mr. F. J. Millard (on cacao butter), and Dr. David Hooper (on cinchona). The programme also included an address from Professor Leech, and the presentation of the first Unofficial Formulary of the Conference. The list of members of the Local Committee and that of the visitors includes many names well known in pharmacy, among them J. C. Arnfield, F. C. J. Bird, S. M. Burroughs, A. W. Gerrard, E. M. Holmes, C. A. Johnstone, S. Kay, T. Kay, J. C. Kidd, W. Martindale, W. Mather, C. Midgley, J. Phillips, A. J. Pidd, B. Robinson, R. Robinson, J. E. Saul, L. Siebold, J. T. Slugg, G. Westmacott, H. Woolley, A. C. Wootton (Editor of THE CHEMIST AND DRUGGIST) and J. R. Young (afterwards president of the Pharmaceutical Society for three years).

Photo] [*Lafayette*

ALDERMAN G. F. TITT
Lord Mayor of Manchester

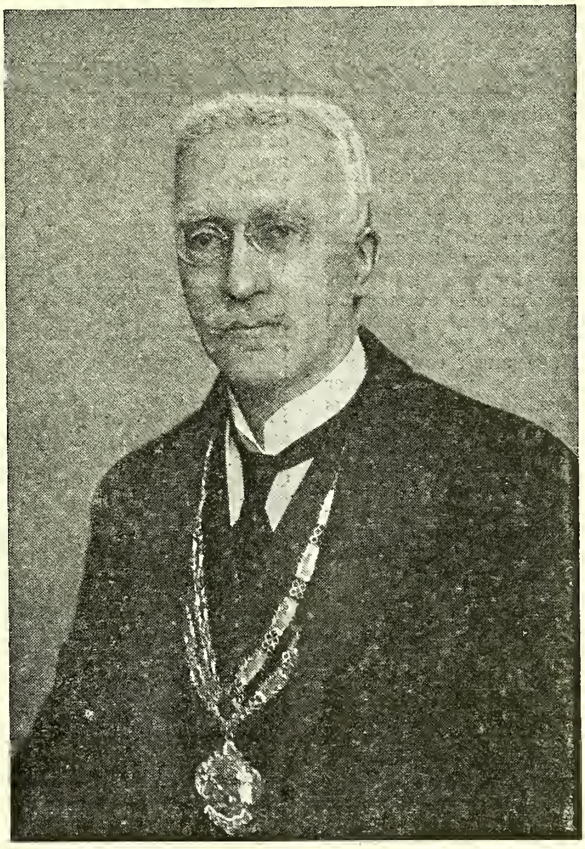
In 1907 the Conference numbered about 700 members, more than half of whom, judging by the attendance list we printed in our report, must have been present at the Manchester meeting. Mr. Thomas Tyrer was president; the list of vice-presidents had undergone several changes since the 1887 meeting, and now included the names (in order of seniority) of Professor Attfield, Mr. Atkins, Mr. Charles Umney, Mr. N. H. Martin, Dr. Symes, Mr. E. M. Holmes, Mr. (now Dr.) G. Claridge Druce, Mr. Idris, Mr. (afterwards Sir) Richard Robinson, Mr. Dott, Mr. G. S. Woolley, Mr. Ransom and Professor Greenish. Mr. J. C. Umney had succeeded his father as treasurer; the general secretaries were Mr. E. Saville Peck and Mr. Edmund White; the local secretary was Mr. William Kirkby; and Mr. G. S. Woolley, as in 1887, was chairman of the Local Committee. The pharmacists and others who presented papers are, with few exceptions, still visitors to the Conference; they include Mr. F. H. Alcock (laboratory problems), Mr. Bird (juniper oil and extract of *Fucus vesiculosus*), Mr. Dott (resinoids), Mr. J. H. Franklin (liquid extract of cascara sagrada and saccharated carbonate of iron), Mr. J. P. Gilmour (the testing of drugs and chemicals), Mr. J. Grier (the pungent principle of ginger), Mr. D. Lloyd Howard (sulphurated antimony), Dr. Martindale (pharmacy notes), Mr. Naylor (*Cucumis trigonus*), Mr. E. Quant (quassia infusion), Messrs. J. C. Umney and C. T. Bennett (juniper oil), Professor R. B. Wild (artificial calamines), Mr. R. Wright (chloroforms of aconite and belladonna). Among the social events were a reception by the Lord Mayor and Lady Mayoress, a garden party given by the Mayor and Mayoress of Salford, and an excursion to Windermere. Our alphabetical record of members present has so familiar an appearance that the majority of the names are likely to reappear in this year's report of the proceedings. As in 1907, we have enlisted the expert services of Mr. John Cleworth (who this year is the official photographer to the Conference), and the results of his watchful judgment will be duly seen. We need hardly add that the majority of the photographs of Manchester pharmacists and pharmacies in our issue of July 11 were specially taken by him to illustrate the article in which they appeared.

BRITISH PHARMACEUTICAL CONFERENCE · 1931 ·

Opening Session

Tuesday, July 21

Jokes on the weather of Manchester must really be given a period of oblivion. The brilliant sunset of Monday evening was followed by a cool and scarcely less bright morning, rendering superfluous the few umbrellas that their owners brought to the Albert Hall. The hall holds over 1,000 people; the gathering of average numbers that assembled for the opening session was thus able to spread itself in comfort without using the gallery. The chairman (Mr. J. H. Franklin) led the procession to the platform soon after 10 o'clock. The Lord Mayor of Manchester (Alderman G. F. Titt) was on the chairman's right hand, and the president of the Pharmaceutical Society (Mr. A. R. Melhuish) on his left; others on the platform included the vice-president of the Society (Mr. F. G. Hines), three past-presidents (Mr. L. Moreton Parry, Mr. Philip F. Rowsell and Mr. Herbert Skinner), Mr. C. A. Hill and Mr. E. Saville Peck (past-presidents of the Conference), Mr. R. R. Bennett, Mr. F. W. Gamble and Mr. D. Lloyd Howard (past-chairmen of the Conference), Mr. John Keall (treasurer of the Pharmaceutical Society), Mr. W. J. Beardsley, Mr. T. Marns and Mr. E. H. Simmons (members of the Society's Council), Mr. H. N. Linstead (secretary of the Society), Dr. F. W. Crossley Holland (treasurer of the Conference), Mr. C. E. Corfield and Mr. G. E. Boyes (general secretaries of the Conference), Councillor R G. Edwards (local secretary) and Mr. A. Maude.



Mr. A. R. Melhuish
President of the Pharmaceutical Society

The opening speeches deepened the impression made by the brilliant function of the previous evening, referred to more fully in our "Social Side." The Lord Mayor possesses in perfection the gift of taking an audience in hand with ready geniality—witness his opening remark, "These people [the flashlight photographers] are the plague of my life." Another effective point in a delightful speech was the fresh turn he gave to the time-honoured jest on pharmaceutical water by involving Councillor Edwards in the story that embodied it. His worship's regret at being unable to attend the Conference banquet was fully shared by the audience. The president of the Society, in replying to the welcome, made it clear that something more than conventional thanks for civic hospitality was actuating the applause of those present. The chairman's address was, at Mr. Franklin's request, read by Mr. Maude. Mr. Franklin's occupancy of the chair is so entirely appropriate at this year's meeting that sincere regret was expressed on all hands at his indisposition—only a temporary trouble, as everyone hopes. The address, a valuable summary of the contribution of Manchester men to science, occupied about fifty minutes in delivery. It is printed in full on pp. 92-97. The customary vote of thanks brought the opening session to an end, leading to the first Science Session, and releasing the ladies for their first excursion.

Apologies for Absence

The Chairman, wishing those present "good morning," said that the first business on the agenda was to announce apologies for absence from Mr. W. A. H. Naylor, Mr. J. Humphrey, Dr. D. Hooper, and Mr. R. Feaver Clarke. Mr. Franklin continued: You will no doubt agree with me that we should like to see all these gentlemen present with us this morning, because they are all men who have done a great deal of valuable work for pharmacy. Now, ladies and gentlemen, it is a very great privilege and a great honour, to have the Lord Mayor of Manchester with us this morning. (Applause.) There is no dispute as to whether the Lord Mayor's day is a seven or a seven and a-half hours' day, because we know in Manchester it is more like fifteen hours a day, and sometimes even more than that. I believe that the Lord Mayor has to attend a command performance of some kind or other in London to-night, and that he will later return to Manchester at midnight to attend a Council meeting to-morrow. In a short time again he will return to the South. If for that reason alone we are privileged to have the Lord Mayor with us, but there are other reasons why we are proud to have him with us. Whatever may be our feelings of gratitude to the Lord Mayor for his presence this morning, and the kind interest he has shown in this Conference, and also for his kindness last night (applause), I am not allowed to say anything about, because the president will say something about that later. I will therefore now ask the Lord Mayor to be good enough to address us.

On rising to reply, The Lord Mayor of Manchester (Alderman G. F. Titt), along with the other occupants of the platform, was asked to pose for a flashlight photograph; amid laughter, after the "shot" the Lord Mayor declared: "These people are the plague of my life."

The Lord Mayor's Speech

The Lord Mayor said: Mr. Chairman, Ladies and Gentlemen, let me first of all express my very best thanks and pleasure at the opportunity of being able to be with you this morning, although unfortunately only for a few moments. After the most congenial occasion of the reception last night, it is a pleasure to meet you again in daylight, and to see you as you are (laughter) rather than as you appear to be in the evening, for the artificial light does not always lend itself to the greatest charms of one's personality. (Laughter.) My duty this morning, however that may be, is to open your proceedings with a word of welcome to this the City of Manchester. I am certain that none of you here this morning doubt for one moment the sincere and genuine welcome which I bring to you on behalf of the City of Manchester. (Applause.)

Your Society is a most important organisation, its members being so closely concerned with the health of the people. On this occasion, therefore, it might be of interest for me to digress for a moment from the most sincere welcome to say that Manchester has the finest water supply in the United Kingdom. (Laughter.) Water is a very important part of your profession. (Laughter.) At any rate, a distinguished member of your Association, who incidentally happens to be a member of the Manchester Corporation, and who used to sit fairly close to me, when I sat at the other end of the Council chamber to that at which I now sit, in a discussion with reference to the purity of the Manchester water supply, rose and addressing the then Lord Mayor, said that "as a member of a profession whose chief ingredient was water," or rather I think he described water as "aqua pura" (laughter), he was delighted to hear that the Manchester water supply was so pure as that outlined by the chairman of the Waterworks Committee. Councillor Edwards was responsible for that statement. Is it not 6 oz. of water, two pinches of Epsom salts, and a little colouring matter—2s. 6d. please? (Laughter.) So I know now why it is you always retire early in life, and are able to enjoy old age much earlier than other people. Be that as it may, I believe that water is a necessary constituent to health. Whether it is necessary to your profession or not, I do not know. but it is certainly necessary to health, and I am immensely proud of the fact that Manchester's water supply is the finest in the country.

Since the passing of the National Insurance legislation the pharmaceutical chemists have played a large part in the treatment of ill health. It is a testimony to the value of the Society in its endeavour to supply properly qualified chemists that the public have the utmost confidence. That is the essential factor of our life to-day, that those of us who are called upon to go into a chemist's shop have security and satisfaction in knowing that when we go with a prescription or to purchase some article, there is on the establishment a fully qualified pharmaceutical chemist, ready and helpful to supply us with the material we want in that highly scientific manner, which is so essential to modern chemistry to-day. I think it will be agreed that is as it should be in any well-ordered community, and I personally rejoice that there is such a body as the Pharmaceutical Society. I will not delay you any longer, because I believe that you have a very long agenda to get through. I believe, also, that before the week is finished you have one or two items on the agenda which are a little less serious than the other items. I refer to the social side of the Conference, which is essential, because, without the social side, conferences cannot be of the same value to the profession or industry concerned. After the heat and burden of discussion has passed away, we can meet together and know each other as we really are, rather than as we appear to be while engaged in heated discussion on matters upon which we hold such different and varied opinions.

So I will now only wish you a successful Conference. I hope also that you will carry away with you a good impression of the City of Manchester. That reminds me that your president informs me that I should think myself lucky I live in Manchester, because when he left London yesterday morning he told me that the weather was atrocious, and Manchester's sun was shining so as to give the Conference a welcome. (Applause.) He told me that on Sunday the weather was more atrocious still, while in Manchester it was fine. As the weather, therefore, welcomed you yesterday, so I this morning, on behalf of the city, most cordially welcome you here. I sincerely trust that during your stay in Manchester the weather will be no worse than it was yesterday. I hope that you will go back to your homes full of enthusiasm, not only for the work which you have accomplished at the Conference, but also for the many things which you have seen in Manchester, full of enthusiasm for the progressive spirit of Manchester in its local government. (Applause.)

The President's Reply

The President (Mr. A. R. Melhuish): Mr. Chairman, Ladies and Gentlemen, I suppose of all the duties which fall to the president of the Pharmaceutical Society no duty is more happy and pleasant than the one which falls to me this morning. It is an endeavour to express something of what you and I have in our minds of gratitude towards the Lord Mayor and Corporation of the City of Manchester. We appreciate very deeply indeed, the most cordial welcome which the Lord Mayor has given us this morning. We appreciate the words of welcome, and we specially thank him for his words of encouragement this morning. But, ladies and gentlemen, there is another ground for expressing your gratitude. I want to say how much we appreciate his welcome last night. (Applause.) The hospitality which he extended to us last night was bounteous, but relatively these things are small when we compare them with the warm reception which the Lord Mayor and Lady Mayoress gave us. (Applause.) I have had the opportunity of speaking to the Lord Mayor this morning, and I took the opportunity of telling him that I was going to thank him in public. This was but to be expected, and due to him. I went further, however, and said that I wanted also to thank him in private for the way in which he had received us and for the hospitality they had so liberally extended to us. It is, I think, the third time upon which the Conference has visited Manchester. I am told that Manchester is celebrated for its water supply. I was told that before I left London, but, ladies and gentlement, it was not quite the water supply which has been alluded to by the Lord Mayor this morning. I was told that Manchester held the record as far as water supply was concerned (laughter), inasmuch as that during the whole year thirteen months were rainy months. (Laughter.) Now, ladies and gentlemen, I know it is not so. You have seen for yourselves the welcome the weather extended to us in Manchester, and this morning she has given us every promise of that beautiful weather extended yesterday. I will say one or two words with regard to our impressions of Manchester. Most of us think of Manchester as the centre and heart of industrial England, and we forget, or are sometimes tempted to forget, what Manchester has produced apart from commerce and industry. They have produced something which concerns us in particular, when we remember the successful works of the celebrated chemist Dalton, who came from Manchester. There are also other workers in art and literature, and, perhaps not least to-day, Manchester has produced able politicians. We trust that if there is perhaps to-day something of a cloud in your great city that cloud will pass away, and that Manchester will rise and be not less in the future than she has been in the past; indeed, that she may be infinitely greater than she has ever been in the past. We have the greatest feeling of gratitude for the reception you, sir, have given us, and we thank you for the welcome extended to us. (Applause.)

The Lord Mayor: Permit me to express on behalf of the City of Manchester and myself, as well as of the Lady Mayoress, our deep thanks for the kind words which have been said concerning us, and the generous manner in which the Conference has received it. I wish to thank you for the kind things you have said about the activities of Manchester, and grateful for the hope expressed that the cloud passing over Manchester at the present moment will finally pass away, and that we shall all return to that prosperity which we knew and experienced before the great industrial depression. One thing I can say, and that is that the Manchester people are facing the problem to-day, as they have faced all problems in the past, with stout hearts and a firm determination to conquer, if it is humanly possible to conquer. (Applause.) May I express my regret at not being able to be with you this evening, as I had hoped to be, but I have to be in London as already explained. I shall, however, be represented by the Lady Mayoress (applause), who will tell me how you go on (laughter), whether you behave yourselves, or not. I am certain you will behave yourselves, either well or otherwise, but at any rate when I come home to-morrow, she will be able to tell me all that has taken place. I regret my absence, because I had specially looked forward to the banquet to-night. I had collected some fairly suitable humorous stories concerning one or two members of the Association ; now these speeches will have to pass left unmade, like all the best orations in the world. (Laughter.)

The Lord Mayor then left the assembly, the members of the Conference standing.

Chairman's Address

The Chairman: There now comes the moment when the chairman makes his address. I must claim your indulgence, because I have to ask somebody to read it for me. This is unusual, but it is no use my making a secret of it. I have had an illness recently, and it is not wise that I should stand up to read the address. I wish to claim your indulgence while Mr. Maude reads it for me.

[The text of the address will be found on pp. 92-97 of this issue.]

Vote of Thanks

Mr. F. W. Gamble: It is customary at this point to propose a vote of thanks to the author of the address. I am reminded that time is getting late, and you are waiting to go on your various visits as arranged, but I cannot refrain from the opportunity of saying a few words which I think may be appropriate. These votes of thanks are intended to give certain speakers the opportunity of saying something which may or may not be relevant. I wish to say something as to the personality of our chairman to-day, and to refer to his useful work for pharmacy. On this occasion I do not think that a more suitable person could have been selected. I have known him for many years, and during that time I have worked more or less beside him. I can imagine that he had but little difficulty in choosing the subject of his address, because his work takes him into close association with the work of the new Pharmacopœia, upon which he has been very active. He is not able to refer to that work, naturally, because it is, so to speak, *sub judice,* and not yet published. The chairman has certainly widened the horizon of all of us. He has given to us an astounding story, as it may be called, of the scientific men of the past in Manchester, or, at any rate, of men who have worked in Manchester for a long period of their lives.

Concluding, Mr. Gamble referred to the trend of these Conferences. They were essentially scientific Conferences, to which was attached a social side, but some of them were at one time afraid that the scientific tendency of the Conferences would be submerged by the social side. He was glad to say, however, that by a certain amount of judicious blending of the two such a condition of affairs was avoided. The chairman, as a representative of the scientific side of the Conference, was a devoted adherent, and they must regard him as one of the exponents of the original Conference idea. Mr. Gamble said he hoped that the scientific basis of those Conferences would not lose in importance in the future. (Hear, hear.) There were now three aspects of the Conference, viz., the scientific, the social and the political sides. They had with them a large number of delegates who were welcomed in every respect for their knowledge and devotion to the cause of pharmacy. He again stressed the point that the scientific side of the Conference ever remains uppermost, although, of course, it might be stimulated either by the social or the political side.

Mr. C. A. Hill, seconding, said that his anticipation regarding the helpfulness of the chairman's address had not been disappointed. The paper had been admirably read in a curtailed form, and they would all have the greater pleasure in reading it in full when printed.

The Chairman, replying, thanked the speakers for the cordial terms in which they had expressed their vote of thanks. He assured them that the study of the atom was one of the most thrilling subjects imaginable. He hoped that at no distant date somebody would write the story of "Chasing the Atom." They were "atom chasers" in Manchester. They had a reputation, which was held by no other centre of the world in learning, on the theory of the conception of matter, which was so important because modern physics was wrapped up in that question at the present moment.

The reading of science papers was then commenced.

Science Section

Tuesday Morning

The first paper taken, presented by Mr. J. R. Walmsley, was:—

"French Tincture of Iodine" (Liquor Iodi Simplex)

By J. R. Walmsley, F.I.C. Ph.C.

[Abstract]

The report of the Pharmacy Subcommittee to the Pharmacopœia Commission, August 1930, states that a new preparation of iodine is required, corresponding to the so-called "French tincture of iodine," and that it should be a 10-per-cent. w/v solution of iodine in 95 per cent. v/v alcohol. The name suggested is Liquor Iodi Simplex. There are probably two important reasons why such a preparation is advocated. First, the recommendation of the International Conference of 1902 that tinctura iodi should be a 10-per-cent. solution of iodine in 95-per-cent. alcohol, and secondly, the demand from the medical profession for a solution for the exhibition of free iodine which does not contain any iodine in combination such as the potassium iodide in tinctura iodi mitis and tinctura iodi fortis. It is stated that solutions containing iodides are more liable to give rise to iodism than a solution containing iodine alone. Such a solution as that given above is unstable, as some of the iodine enters into combination, and similar solutions which have been official in the foreign pharmacopœias have been deleted for this reason. (Examples from France, Germany and the United States are given by the author.)

It has been shown that hydriodic acid, aldehyde and acetic acid are formed on keeping a simple solution of iodine in alcohol. There is reaction between the iodine and the alcohol forming hydriodic acid and aldehyde, the latter then forming acetic acid, which in turn esterifies some of the alcohol. It has been found that the addition of potassium iodide prevents these changes. This has been confirmed by workers in this country and on the Continent, two of the latter showing that the loss of free iodine in six to twelve months was 20 per cent. of the total. It is presumed that, in the present official tinctures, the iodine is in loose combination with the potassium iodide as KI_3, and its activity being thus checked it does not attack the alcohol. The ratio of iodine to potassium iodide required to form KI_3 is as 10 is to 6.535, so that tinctura iodi fortis with its 6 per cent. of potassium iodide practically satisfies this requirement. The proposed change in the weaker tincture by which the potassium iodide is reduced from 2.5 per cent. w/v to 1.5 per cent. w/v will make the ratio the same as in the strong tincture. It has been found that a partly filled bottle of weaker tincture, which when prepared contained 2.50 per cent. w/v of iodine with 0.035 per cent. w/v of acid as HI, after keeping twelve months contained 2.60 per cent. w/v of iodine and 0.0416 per cent. w/v of acid as HI. This increase can be attributed to evaporation of the solvent.

Fresh Investigation

In order to study the behaviour of the proposed "French tincture of iodine" a large sample was made under pharmacy conditions. It was found that with free shaking at room temperature it required seven days for all the iodine to go into solution. On titration with thiosulphate only 9.67 per cent. w/v of iodine was indicated. It was therefore adjusted to 10 per cent. w/v of iodine and retested at approximately fortnightly intervals.

After 11 days it contained 9.67% w/v free iodine.
After 26 days it contained 9.30% w/v free iodine.
After 41 days it contained 9.03% w/v free iodine.
After 56 days it contained 9.00% w/v free iodine.
After 71 days it contained 8.93% w/v free iodine.
After 86 days it contained 8.78% w/v free iodine.
After 101 days it contained 8.68% w/v free iodine.

That is, a loss of free iodine amounting to about 15 per cent. had taken place during three months. A laboratory sample was also prepared, using purest freshly resublimed iodine. This dissolved completely in two days and was then found to test 9.747 per cent. w/v of free iodine, that is, 2.5 per cent. of the iodine had combined during solution. This was than retested as above with the following result:—

After 5 days it contained 9.494% w/v free iodine.
After 11 days it contained 9.300% w/v free iodine.
After 26 days it contained 9.187% w/v free iodine.
After 41 days it contained 8.832% w/v free iodine.
After 56 days it contained 8.699% w/v free iodine.

In this case there is a loss of 13 per cent. of the free iodine in less than two months. In order to ascertain if the use of heat to hasten solution had any effect, a sample was made by placing 25 grams of pure resublimed iodine in a stoppered graduated flask, filling nearly to the mark with 95-per-cent. alcohol, immersing in a water bath heated to 70° C. and shaking at intervals. It was then cooled to 15° C. and adjusted to 250 mils. It was found that solution was complete in less than half an hour. On titration 9.829 per cent. w/v of iodine was found with 0.160 per cent. w/v of hydriodic acid (HI). The sample was divided between two 4-oz. stoppered bottles, one of which was kept in strong light, the other kept in a dark cupboard and both retested after several days.

——	Kept in light	Kept in dark
After 7 days, free iodine ..	=9.329% w/v	=9.448% w/v
After 21 days, free iodine ..	=9.023% w/v	=9.162% w/v
Hydriodic acid	=0.940% w/v	=0.785% w/v

A similar sample made without heat was found to require seven days to effect solution. It was then found to contain 9.428 per cent. w/v of free iodine. When kept under the same condition as the above the samples gave:—

——	Kept in light	Kept in dark
After 5 days, free iodine ..	=9.276% w/v	=9.428% w/v
After 15 days, free iodine ..	=9.175% w/v	=9.240% w/v
After 35 days, free iodine ..	=8.768% w/v	=8.864% w/v
Hydriodic acid	=1.228% w/v	=1.126% w/v

These experiments show that as the iodine goes into solution it reacts with the alcohol, thus causing a loss of free iodine. The reaction continues for four months at least, the rate being slightly accelerated by exposure to light. The product of the reaction is hydrodic acid, but some ethyl acetate is also formed and can be detected by its odour.

Conclusions

It would appear that the Pharmacy Subcommittee has erred by recommending that such an unstable preparation as a simple alcoholic solution of iodine be inserted in the British Pharmacopœia. The supposed advantage of having a solution free from combined iodine is defeated by the reaction of the iodine with the alcohol, forming the compound hydriodic acid, which also renders the solution strongly acid. Such a change does not take place in the tinctures which contain potassium iodine, and therefore they should meet all the requirements for alcoholic solutions of iodine.

Thanks are due to James Woolley, Sons & Co., Ltd., for permission to publish.

Discussion

The Chairman, in inviting discussion, pointed out that the paper had been submitted at a very appropriate moment.

Mr. Melhuish remarked that the medical profession wanted, rightly or wrongly, a plain ("French") tincture of iodine. There was a great deal of confusion on the subject in the profession. He suggested that either medical men should be educated to prefer the tincture containing potassium iodide or the plain tincture should be freshly prepared on every occasion.

Mr. Lescher pointed out the Home Office Regulations ordered a 2-per-cent. solution of iodine in ampoules for use in mines and on railways. It did not test up to 2 per cent. after keeping.

Mr. Bennett called attention to an error in the Pharmacy Subcommittee's report on the tincture. The 1908 French Codex preparation was a solution of the strength 10 per cent. w/w, not 10 per cent. w/v. Clinicians liked the plain solution of iodine, which might be useful therapeutically.

Mr. Fouracre inquired whether there was any clinical evidence that the alcoholic solution was better. Its administration was with milk as the vehicle, possibly the iodine was thus rendered colloidal. Lugol's solution in water could be used in place of the ordinary tincture.

Mr. Jackson (Newcastle) remarked that a simple tincture was still in demand.

Mr. Bull agreed that the medical profession wanted a simple tincture. To give it in milk was to get away from the free iodine.

Mr. Brewis believed that medical men were anxious to administer free iodine in combination with the casein of milk; it was free from depressing effects.

The Chairman asked whether doctors really knew what they wanted. The amount of potassium iodide in the British tincture was infinitesimal.

Mr. Walmsley, in reply to the points raised, said that he was only concerned with the pharmacy of the subject. He wanted to establish a standard product. Possibly the use of the name "French tincture" was a factor in acceptability. (Laughter.)

In the absence of the authors the next paper was read by Mr. Corfield:—

The Determination of Strychnine in Easton's Syrup

By L. A. Haddock, B.Sc., and Norman Evers, B.Sc., F.I.C.

[Abstract]

In a previous paper one of the authors described a method for the determination of strychnine in the presence of quinine, based on the extraction of the strychnine by chloroform from a solution of the alkaloids made acid with hydrochloric acid. A further examination of this method has now been made and is the subject of the present communication. From a consideration of the results detailed in the latter part of the paper the following method is recommended:—

Dissolve the total alkaloids in 20 c.c. of *N*/1 hydrochloric acid and transfer to a separator, washing out the flask with a further 5 c.c. of the acid followed by 25 c.c. of a saturated solution of sodium chloride, transferring each washing to the separator. Extract the acid liquid by shaking with five successive portions of 25 c.c. of chloroform, shaking for five minutes with each portion. Wash the combined chloroform extracts by shaking for five minutes with two portions of 5 c.c. of a mixture of equal volumes of $N/1$ hydrochloric acid and a saturated solution of sodium chloride. Extract the combined washings by shaking thoroughly with 10 c.c. of chloroform and add the latter to the bulked chloroform extracts. Shake the latter with a mixture of 20 c.c. of water and 5 c.c. of solution of ammonia (10 per cent.). Separate and wash the chloroform by shaking with 5 c.c. of water. Distil off the chloroform and add 1 c.c. of alcohol, evaporate to dryness and dry the residue for a short time at 100° C. Wash the residue in the flask with three portions of 2 c.c. of a mixture of two volumes of ether with one volume of petroleum spirit previously saturated with strychnine. Decant off the solvent each time through a small plug of cotton-wool. Wash any alkaloids on the wool back into the flask with 3 c.c. of chloroform. Add 1 c.c. of alcohol, evaporate to dryness, dry to constant weight at 100° C. and weigh the strychnine.

The method may be applied directly to the syrup by taking 50 c.c. of syrup, 50 c.c. of saturated sodium chloride and 5 c.c. of concentrated hydrochloric acid, and using double quantities of chloroform, etc., throughout the process.

Results (in grams)

Quinine taken	Strychnine taken	Strychnine found
1.5	0.05	0.050
1.5	0.03	0.0295
1.5	0.03	0.0305
1.5	0.01	0.0090

Driver and Thompson have shown that the solubility of strychnine hydrochloride diminishes with increasing concentration of hydrochloric acid up to $2N$ strength, but they did not determine the solubility in higher concentrations than this. The authors find that the solubility increases rapidly with increasing concentration of hydrochloric acid about $2N$. (Tables are given.) The increase of the chlorine-ion concentration by the addition of sodium chloride instead of hydrochloric acid was then tried. A practically complete extraction of the strychnine from a sample of Easton's syrup was effected by extracting after adding an equal volume of saturated sodium chloride solution. Certain difficulties were encountered in the separation of iron phosphate with consequent emulsification. It was therefore considered essential that some hydrochloric acid should also be present in order to keep the iron phosphate in solution. (The results are tabulated.) Reduction of the concentration of hydrochloric acid below $N/2$ resulted in the extraction of larger amounts of quinine, while increase above $N/2$ was considered undesirable on account of the increased solubility of strychnine hydrochloride. (A table is given.)

It was therefore decided that the best concentration for an analytical method which should be equally applicable to the syrup or to the residue of total alkaloids would be a half-saturated solution of sodium chloride in $N/2$ hydrochloric acid. The only other solvent among those tried in which strychnine hydrochloride had a solubility comparable with that in chloroform was carbon disulphide, which has obvious disadvantages. It was found that by washing the mixed chloroform solutions twice with 5 c.c. of the acid-sodium chloride menstruum most of the residual quinine was removed, and by shaking the washings with 10 c.c. of chloroform and adding the latter to the main bulk the loss of strychnine in this operation was negligible Undoubtedly the reduction of the acidity of the solution as compared with the previous method brings about the extraction of a greater amount of quinine by the chloroform, but this is largely removed by the above washings. In the previous method washing with three quantities of 1 c.c. of ether was recommended. Strychnine is not insoluble in ether, and actually a loss of 1.3 mgm. occurs in this washing. At the same time a study of the relative solubilities of quinine and strychnine in a number of solvents shows that in no others does the difference in solubility approach that in ether. (A table is inserted.) It is therefore only possible to reduce the solubility of strychnine in ether by adding petroleum spirit, but this will also reduce the solubility of quinine. Nevertheless it seemed possible that by adding a proportion of petroleum spirit to the ether the extraction of the quinine might still be complete, while the loss of strychnine would be reduced. Actually the authors found that by the addition of one-third of the volume of petroleum spirit to the ether the extraction of quinine was not affected, but the loss of strychnine was halved. A further improvement was effected by saturating this solvent with strychnine, and experiments showed that no loss of strychnine now occurred and that no quinine remained in the residue. It may be suggested that the method might be greatly simplified by washing the original residue of total alkaloids with the solvent. If, however, the ratio of quinine to strychnine in the residue appreciably exceeds unity, it is not practicable to wash out the quinine completely with the solvent. It is therefore necessary to remove the bulk of the quinine by means of the method described above before treatment of the residue.

The authors thank Allen & Hanburys, Ltd., for permission to publish this paper.

Discussion

Mr. Corfield said he had intended to ask the authors how much data they had collected in confirmation of the modified process. The older method had given results which he considered suffered from errors in the process of extraction.

The authors were thanked by the Chairman.

The next paper taken (read in abstract by Mr. A. J. Jones) was:—

The Correlation of Chemical and Toxicity Tests on Mercurochrome

By H. A. Mitchell, M.D.

[Abstract]

An opportunity of exploring the causes of variation in chemical composition and toxicity of mercurochrome-220 (soluble) is provided by the need of close co-operation between physiological and chemical research in testing this substance at the Evans Biological Institute. Experiments on rabbits by Pope and others show that toxicity does not correspond to mercury content. In the manufacture of mercurochrome, a mixture of dibromo-fluorescein and mercurio acetate is allowed to react to produce dibromo di-hydroxy-mercuri-fluorescein, which is converted to its sodium salt known as mercurochrome-220. Such mercurochromes may contain unchanged di-bromo fluorescein, di-bromo di-hydroxy mercuri-fluorescein, or mercury salts. Products analytically identical may, in fact, vary widely in composition and toxicity. Extraction with organic solvent (ether) of the precipitate obtained by acidifying (with dilute sulphuric acid) provides an indication of the contaminants, but is unsatisfactory owing to difficulty in completing extraction and avoiding decomposition. The acid from a certain sample of mercurochrome, after purification by repeated reprecipitation, had a mercury content of 35.6 per cent., indicating the presence of a more highly mercurated compound than mercurochrome.

The routine method finally adopted takes advantage of the more basic character of di-bromo-fluorescein, a gelatinous precipitate being formed upon partial neu-

tralisation which is probably the monosodium salt of the dye. This method of fractional precipitation was found to be efficient and convenient for separating the mercurated product from unchanged di-bromo-fluorescein. Moisture is determined as loss in weight at 105° C. in twenty-four hours. Toxicity tests and Ph value are determined upon 0.45 per cent. dry weight solution (within less than an hour to avoid sedimentation). Colour, immediate turbidity, and twenty-four-hour sediment are observed in a Nessler glass upon 0.05-per-cent. solution in distilled water. Total mercury is estimated upon 25 c.c. of 2-per-cent. solution. Fractionation is performed upon 100 c.c. of 2-per-cent. solution, 18 c.c. of seminormal solution of sulphuric acid being added, the mixture allowed to stand for five minutes and filtered, the presence of ionic mercury being indicated by darkening of filtrate (or precipitation) after passing in hydrogen sulphide gas. The precipitate of total free acids, after washing, is dissolved in 80 c.c. of water and 16 c.c. of *N*/2 sodium hydroxide solution. The combined filtrate and washings are partially acidified with 11 c.c. of *N*/2 sulphuric acid. After fifteen minutes a gelatinous precipitate of true mercurochrome, acid and other mercurated compounds is collected. Their mercury content is determined upon the washed and dried product obtained by redissolving in *N*/2 sodium hydroxide solution (10 c.c.) and completely re-precipitating with *N*/2 sulphuric acid (12 c.c.). Unchanged dye in the dried mercurochrome acids will impart a yellow colour to the solvent when shaken with chloroform. Free dye is determined upon the filtrate after partial acidification by adding 10 c.c. of *N*/2 sulphuric acid and weighing the precipitate after washing and drying. The method adopted for the estimation of mercury consists in oxidising with potassium permanganate in alkaline solution, and adding oxalic acid before acidifying with sulphuric acid. A clear white solution is obtained for sulphide precipitation without the troublesome spurting of acid permanganate oxidation. The results of examination of nine samples of mercurochrome as manufactured and purchased are given in the following table:—

Moisture per cent.	Sediment	Ionic mercury	Ph	Mercury in high mercury fraction	Weight of free dye per cent.	Total mercury on dry solid per cent.	Toxicity in mgm. mercury per kgm. mouse	Toxicity in mgm. dry solid per kgm. mouse	Toxicity in mgm. original solid per kgm. mouse
4.77	+ −	Nil	8.4	32.26 (*f*)	0.485 (*c*)	27.06	24.35	90	94.7
10.28	+	+	8.5	34.45 (*f*)	0.143 (*c*)	27.94	24.2	86.3	94
3.35	+ +	+	8.45	32.36 (*f*)	0.594 (*c*)	27.93	23.6	84.5	87.5
4.04	+ −	Nil	8.3	30.53 (*f*)	0.074 (*c*)	26.79	23.2	87	91
9.42	+ −	+ −	8.1	28.53 (*c*)	0.174 (*f*)	24.87	22.6	90	99.4
9.87	+ +	+ +	8.65	x	x	27.12	20.64	76	85
2.65	+ + +	+ + + +	8.7	33.19 (*c*)	0.074 (*f*)	28.46	20.5	72	74
6.18	+ +	+	8.35	x	x	28.5	19.4	76	81
4.06	+ + +	+ +	8.85	32.36 (*c*)	0.154 (*f*)	26.89	17.5 less than	62.36 less than	65 less than

(*f*) and (*c*) indicate freedom from dye or contaminated with dye in column 5, or freedom from mercurated compounds or contamination with them in column 6.

It will be seen that the moisture content varies greatly, and that all samples contain free dye and a compound more highly mercurated than the theoretical mercurochrome. Other conditions being satisfactory, the least toxic samples accord with the theoretical amount of mercury. Though the results are not deemed conclusive, the following points are suggested as worthy of consideration:—

(1) Moisture content should be stated or limits fixed.

(2) Total mercury to be between 26.0 and 28.0 per cent. of dry product.

(3) The toxicity should not be less than 23 mgm. of mercury per kgm. of mouse.

(4) Ph value between 8.25 and 8.55.

(5) Ionic mercury test to show only a trace.

(6) Sedimentation test to give a trace only.

The help of Messrs. G. E. Shaw, B.Sc., and J. Pritchard in carrying out the physiological and chemical experiments at the Evans Biological Institute is acknowledged.

DISCUSSION

The CHAIRMAN remarked that it was important to have this drug without variation.

Mr. BENNETT, who was the only other speaker on this paper, said it was gratifying that it should be presented only twelve months after a previous paper on the subject. There was an enormous variation in commercial samples; that might not matter much in the case of external application, but for intravenous injection it was another question. Mercurochrome should be physiologically standardised.

The author was thanked by the CHAIRMAN.

In the absence of the author, Mr. R. R. Bennett read an abstract of the next paper:—

The Assay of the Official Balsams

By T. TUSTING COCKING, F.I.C.

[ABSTRACT]

THE accurate determination of the balsamic acids present in balsams of tolu, benzoin and storax presents considerable difficulty owing to the nature of the other substances contained in these drugs. The balsamic acids occur partly in the free state, partly combined as esters of aromatic alcohols, and partly as esters of resinoid alcohols, and their complete extraction from the resinous matrix of the drug is extremely difficult. The present official method for the assay of cinnamic in prepared storax consists essentially of the following steps:—The cinnamic acid is extracted from the total acids of the balsam by boiling with water; the hot aqueous solution is filtered, then cooled, and the cinnamic acid which crystallises out is separated from the mother liquor, which is again boiled up with the resinous matrix. The process is repeated until no more cinnamic acid is extracted.

It has been found to be impossible by this method to extract all the cinnamic acid. In the present note there is described a modification of the magnesia method, which is much simpler to carry out, and which extracts the balsamic acids more readily and more completely than the earlier methods.

The details of the method for the determination of total balsamic acid are as follows:—2.5 gm. of prepared storax or balsam of tolu, or in the case of benzoin, the alcoholic extractive from 2.5 gm. of the drug, are saponified by boiling with 25 c.c. of *N*/2 alcoholic potassium hydroxide in the usual manner. The alcohol is evaporated and the residue, consisting of the potassium salts of the balsamic and resin acids, together with the aromatic and resinoid alcohols and the excess of potassium hydroxide, is digested with 50 c.c. of hot water. Complete solution does not take place, as the aromatic and resinoid alcohols are only partially soluble in the alkaline solution, but they become diffused throughout the liquid. After cooling, 150 c.c. of cold water are added and the resin acids are precipitated by the addition of 2.5 gm. of crystallised magnesium sulphate dissolved in 50 c.c. of water. The amount of magnesium sulphate used is slightly more than the chemical equivalent of the potassium hydroxide employed in the saponification, so that all the potassium salts are converted into the corresponding magnesium salts. While the magnesium salts of the balsamic acids are soluble in water, the salts of the resin acids are insoluble, and the excess of alkali precipitates magnesium hydroxide. The precipitate is filtered on a Buchner funnel and washed with a little water. The clear filtrate, which is only slightly alkaline and contains the whole of the balsamic acids as magnesium salts, together with a certain amount of neutral substance (aromatic alcohols, etc.), is acidified with hydrochloric acid and extracted with ether.

In the process which is recommended the ethereal solution is extracted five times with 5-per-cent. aqueous solution of sodium bicarbonate, each portion being washed consecutively with a small quantity of ether. Finally the bulked alkaline solutions are acidified with hydrochloric acid and extracted with ether; the greater part of the ether is distilled off and the residue is distributed over the surface of the flask to facilitate drying, which is carried out in a vacuum desiccator over sulphuric acid. The dried acids are then weighed. In the case of storax the acid may be titrated, as it consists almost entirely of cinnamic acid, averaging about 99-per-cent. purity, but the acids from balsam of tolu and benzoin consist of a variable mixture of benzoic and cinnamic acids, and it is therefore necessary to weigh them. On neutralising the alcoholic solution of balsam of tolu with normal alcoholic potassium hydroxide, potassium benzoate and cinnamate were precipitated in the form of white clots, these salts being only slightly soluble in strong alcohol. At the same time a soft brown sticky mass separated and on subsequent dilution with water a very unsightly mixture resulted.

The method which has finally been adopted is as follows:—2.5 gm. of the balsam of tolu is dissolved in 15 c.c. of hot 90-per-cent. alcohol in a 300-c.c. flask and then 10 c.c. of solution of potassium hydroxide (liq. potassæ B.P.) diluted with 50 c.c. of water is added all at once. The smoky-brown translucent mixture which results is immediately diluted with 150 c.c. of water; 50 c.c. of a 5-per-cent. solution of magnesium sulphate is then added and the flask is heated on a water-bath for five minutes to coagulate the precipitate of magnesium salts. The mixture is then filtered on a Buchner funnel and the balsamic acids are extracted from the filtrate by the procedure adopted for the total balsamic acids. The amount of potassium hydroxide used for the neutralisation of the free acids is slightly in excess of that indicated by the highest acid value of balsam of tolu, so that a little magnesium hydroxide is precipitated along with the other magnesium salts. The magnesium precipitate coagulates readily on warming, and the liquid then filters fairly easily, but if the preliminary warming be omitted filtration is slow and the filter paper becomes clogged. As the aromatic alcohols are much more soluble in a warm solution of the magnesium salts than in the cold, the mixture should be allowed to become quite cold before filtering. The same procedure may be used for the determination of the free balsamic acids in benzoin.

Summary

An improved method for the determination of the balsamic acids in balsam of tolu, benzoin and storax is described. The total acids from the saponified balsams are converted into the corresponding magnesium salts and the salts of the balsamic acids are separated from the salts of the resin acids by filtration. The aromatic alcohols which are not completely separated from the balsamic acids by this treatment are separated from an ethereal solution by extracting the latter with a solution of sodium bicarbonate. The balsamic acids are finally extracted from an acidified solution with ether and, after drying in vacuo over sulphuric acid, are weighed. By adopting a different preliminary treatment, the free balsamic acids in balsam of tolu and benzoin may be determined by the same method.

From the Laboratories of The British Drug Houses, Ltd.

Discussion

The Chairman said this was undoubtedly a work which would be appreciated by the Pharmacopœia Commission.

Mr. Corfield congratulated Mr. Cocking on the paper. He had used the author's original method with very satisfactory results. He was pleased to have the new method, which he looked forward to employing.

Mr. Jones (Liverpool) considered that the standardisation of acid and ester should be on soluble extracts.

Mr. Brewis congratulated Mr. Cocking on his criticism of the Pharmacopœia method, which was unsatisfactory, whereas the speaker regarded the method now suggested as a very satisfactory one. With regard to sampling balsams, as the Pharmacopœia has purified storax, was it not possible, he asked, to have purified benzoin and tolu as well, as it was difficult to get an average sample of these?

Mr. Bennett said he would convey the comments to the author.

The last paper taken at this meeting was: —

The Assay of the Cinchona Galenicals Proposed for the British Pharmacopœia

By P. A. W. Self, B.Sc., F.I.C., Ph.C., and C. E. Corfield, B.Sc., F.I.C., Ph.C.

[Abstract]

The appearance of a new edition of the British Pharmacopœia may result in a new series of galenical preparations of cinchona bark, and with this change the many anomalies and difficulties connected with the assays of the preparations at present in use will automatically disappear. Todd suggested the introduction of a soft extract of cinchona, standardised on its total alkaloid content and prepared by a process described by him, from which the liquid extract, tinctures and other preparations might be prepared by dilution. The Pharmacy Subcommittee of the Pharmacopœia Commission have recommended the introduction of preparations prepared on this principle, and the following have been considered for the next edition: —

(1) Extractum Cinchonæ prepared with glycerin and alcohol and standardised to contain 10 per cent. of total alkaloids.

(2) Extractum Cinchonæ Liquidum prepared from the extract with hydrochloric acid, glycerin, alcohol and water and standardised to 5 per cent. w/v of total alkaloids.

(3) Tinctura Cinchonæ prepared by dilution by the extract with 70-per-cent. alcohol and containing 1 per cent. w/v of total alkaloids.

(4) Tinctura Cinchonæ Composita prepared with 5 per cent. of the standardised extract and containing 0.5 per cent. w/v of total alkaloids.

We find that, on the whole, the assays of these new preparations present fewer difficulties than the assays of the corresponding preparations of the present Pharmacopœia, no doubt owing to the use of strong alcohol in the extraction of the bark. Consequently, by carefully adjusting the volumes of the liquid to be extracted and of the immiscible solvent employed, it is possible to avoid emulsions entirely and also to extract the alkaloids completely and in a very pure state. We have investigated a number of samples of the four preparations recommended, prepared by four different manufacturers.

Extractum Cinchonæ

Take about 2 grams of the extract and wash into a separator with 10 millilitres of a mixture of equal volumes of alcohol and water. Add 1 millilitre of $N/1$ hydrochloric acid and 20 millilitres of chloroform and shake vigorously for about two minutes; run the chloroform layer into a second separator containing 5 millilitres of $N/1$ sulphuric acid, shake well, allow to separate and reject the chloroform. Repeat the extraction of the liquid in the first separator with two further quantities of chloroform, transferring to the second separator and washing with the same acid liquid as before. To the contents of each separator add 2.5 millilitres of sodium hydroxide solution and well mix. Then shake the contents of the first separator with 20 millilitres of chloroform for about two minutes, transfer the chloroform layer to the second separator and again shake, and separate the chloroform solution of alkaloids. Extract the contents of the first separator with further quantities of 20 millilitres of chloroform, transferring each time from the first separator to the second separator, until the alkaloids are completely extracted. Wash the mixed chloroform extracts with a little water, distil off the chloroform, add 5 millilitres of alcohol, evaporate, dry at 100° and weigh.

The use of the volumes of chloroform prescribed ensures, according to our experience with the four samples of extract tested, that no emulsion forms, however vigorously the mixture is shaken. Vigorous shaking is, in fact, very desirable, since some of the alkaloids of cinchona are not very readily soluble in chloroform.

Extractum Cinchonæ Liquidum

Weigh about 5 millilitres of the liquid extract and wash into a separator with 10 millilitres of a mixture of equal volumes of alcohol and water. Add 1 millilitre of *N*/1 hydrochloric acid and 20 millilitres of chloroform and shake vigorously for about two minutes; run the chloroform layer into a second separator containing 5 millilitres of *N*/1 sulphuric acid, shake well, allow to separate and reject the chloroform. Repeat the extraction of the liquid in the first separator with two further quantities of chloroform, transferring to the second separator and washing with the same acid liquid as before. To the contents of each separator add 2.5 millilitres of sodium hydroxide solution and well mix. Then shake the contents of the first separator with 20 millilitres of chloroform for about two minutes, transfer the chloroform layer to the second separator and again shake, and separate the chloroform solution of alkaloids. Extract the contents of the first separator with further quantities of 20 millilitres of chloroform, transferring each time from the first separator to the second separator until the alkaloids are completely extracted. Wash the mixed chloroform extracts with a little water, distil off the chloroform, add 5 millilitres of alcohol, evaporate, dry at 100° and weigh.

Tinctura Cinchonæ

Evaporate 25 millilitres of the tincture to about 3 millilitres and wash a separator with 10 millilitres of a mixture of equal volumes of alcohol and water. Add 1 millilitre of *N*/1 hydrochloric acid and 20 millilitres of chloroform and shake vigorously for about two minutes; run the chloroform layer into a second separator containing 5 millilitres of *N*/1 sulphuric acid, shake well, allow to separate and reject tho chloroform. Repeat the extraction of the liquid in the first separator with two further quantities of chloroform, transferring to the second separator and washing with the same acid liquid as before. To the contents of each separator add 2.5 millilitres of sodium hydroxide solution and well mix. Then shake the contents of the first separator with 20 millilitres of chloroform for about two minutes, transfer the chloroform layer to the second separator and again shake, and separate the chloroform solution of alkaloids. Extract the contents of the first separator with further quantities of 20 millilitres of chloroform, transferring each time from the first separator to the second separator, until the alkaloids are completely extracted. Wash the mixed chloroform extracts with a little water, distil off the chloroform, add 5 millilitres of alcohol, evaporate, dry at 100° and weigh.

Tinctura Cinchonæ Composita

Evaporate 25 millilitres of the compound tincture to about 3 millilitres and wash into a separator with 10 millilitres of a mixture of equal volumes of alcohol and water. Add 1 millilitre of *N*/1 hydrochloric acid and 20 millilitres of chloroform and shake vigorously for about two minutes; run the chloroform layer into a second separator containing 5 millilitres of *N*/1 sulphuric acid, shake well, allow to separate and reject the chloroform. Repeat the extraction of the liquid in the first separator with two further quantities of chloroform, transferring to tho second separator and washing with the same acid liquid as before. To the contents of each separator add 2.5 millilitres of sodium hydroxide solution and well mix. Then shake the contents of the first separator with 35 millilitres of chloroform for about two minutes, transfer the chloroform layer to tho second separator and again shake, and separate the chloroform solution of alkaloids. Extract the contents of the first separator with further quantities of 35 millilitres of chloroform, transferring each time from the first separator to the second separator, until the alkaloids are completely extracted. Wash the mixed chloroform extracts with a little water, distil off the chloroform, add 5 millilitres of alcohol, evaporate, dry at 100° and weigh.

In all the samples which we have tested 35 millilitres was quite sufficient to prevent emulsification, but it is quite possible than an occasional sample may be more troublesome, in which case a slight increase in the volume of chloroform may be desirable.

Summary

Processes are described by which the extract, liquid extract, tincture and compound tincture of cinchona recommended for the new pharmacopœia by the Pharmacy Subcommittee may be assayed. Emulsification difficulties have been overcome and the processes give accurate results with the minimum of trouble when the galenicals are prepared by the methods recommended. (From the laboratories of Harrison & Self.)

Discussion

Mr. Walmsley said he had tried the authors' process, and found it worked well. He would like a satisfactory process for the assay of cinchona bark.

Mr. Corfield, in reply, referred Mr. Walmsley to the process of Messrs. Self and Corfield, which formed the subject of a paper at a recent Conference.

The Chairman thanked the authors, and adjourned the proceedings till the afternoon.

Science Section

Tuesday Afternoon

A normally small muster of members answered the call of the chairman on Tuesday afternoon, the larger number being either at the delegates' meeting or sightseeing.

The first paper to be read was on

Theophylline Sodium Acetate of Commerce

By G. J. W. Ferrey, B.Sc., A.I.C.

[Abstract]

While theophylline acts therapeutically in a similar way to its isomer theobromine, it has medicinal uses distinct from those of the latter and is said to have a stronger diuretic effect and to be more irritant to the mucous membrane. So far as can be ascertained, all theophylline on the English market is of Continental manufacture, and this applies also to its salts and compounds. Of twelve parcels labelled theophylline sodium acetate examined recently, three have been proved to be actually the theobromine compound. Such substitution has two important consequences. First, the use of theobromine as theophylline would undoubtedly lead to unexpected clinical results and thus tend to bring the drug into unmerited disrepute, as well as, of course, depriving the patient of his proper treatment. Secondly, since the theophylline compound costs several shillings an ounce, and is about six times the price of the corresponding theobromine salt, the question has a not unimportant commercial aspect.

The solubility of the salt is a guide to its identity, as the theobromine compound, when pure, is soluble in two parts of water. However, a badly "carbonated" sample of the theobromine salt may require much more water for complete solution, and so be indistinguishable in this respect from theophylline sodium acetate. There are no qualitative tests which may be applied to theophylline sodium acetate itself to prove that it actually contains theophylline; it is necessary in the first place to isolate the alkaloid. This is done by precipitation with *N*/1 hydrochloric acid in the usual way, but litmus or universal indicator must be employed for the titration (phenolphthalein is useless), and the compound is dissolved in ten parts of warm water. The free alkaloid crystallises out on cooling, and may be dried down at 100° C. The three alkaloids—theophylline, theobromine and caffeine—are conveniently distinguished by their solubilities in dilute solutions of potassium hydroxide and ammonia. These should not be too strong; normal solutions are sufficiently concentrated. Convenient quantities are 0.1 gram of the alkaloid and 5 c.c. of the normal alkali. (A table of solubilities is given by the author.) Where further confirmation is desired recourse to the melting point is probably the best. The following are the melting points given in International Critical Tables (I, 211, 220):—Caffeine 237°, theobromine 337°, and theophylline 252° C.

Two formulas are given for theophylline sodium acetate in pharmaceutical literature, the first anhydrous and the second a monohydrate, $C_7H_7N_4O_2Na.NaCOOCH_3.H_2O$. Analysis of eight commercial samples showed that neither of these formulas accurately represents the actual composition of the majority of the specimens. Only two of these samples contained more than 60 per cent. of theophylline. (Details of analysis are tabulated in the paper.)

Conclusions

Sample E corresponds closely to the anhydrous formula, while sample D represents the monohydrate, although slightly deficient in theophylline. Sample F, although it contains a high percentage of theophylline, has an otherwise remarkable composition, containing at least 9 per cent. excess water and only about 60 per cent. of the proper amount of sodium acetate. Sample G contains theophylline and sodium acetate in exactly equimolecular proportions, and if dried, would correspond exactly to the formula $C_7H_7N_4O_2Na.NaCOOCH_3$. It has presumably not been properly dried during manufacture. As it is, it is deficient in both theophylline and sodium acetate to the extent of at least 18 per cent. Sample A is deficient in theophylline to about the same extent, but in this case the deficiency must be attributed to the use of an insufficient proportion of theophylline in the manufacture, since the sodium acetate is very greatly in excess and the product practically anhydrous. In sample B, the deficiency in theophylline may, as in sample G, be attributed to insufficient drying, since dehydration would raise the theophylline content to 62.5 per cent. The alkaloid and sodium acetate are present in practically equimolecular proportions. Sample C is similar to sample A, while sample H is of very poor quality indeed, containing less than two-thirds of the proper amount of theophylline.

It is evident that many samples of theophylline sodium acetate are deficient in theophylline owing to the presence of an excessive amount of water. In these cases, the alkaloid and the sodium acetate may be present in exact molecular ration to one another. There appears to be no justification for the assumption of a molecule of water as an integral part of the theophylline sodium acetate complex, and as there would seem to be no great difficulty in rendering the compound anhydrous, it is suggested that the theoretical composition might well be represented by the anhydrous formula. It is further suggested that both theophylline and theophylline sodium acetate are of sufficient importance to merit separate monographs in the British Pharmaceutical Codex, especially in view of the cases of substitution to which attention was drawn in the early part of this paper. With regard to the quantitative composition of theophylline sodium acetate, while the anhydrous formula is undoubtedly the best theoretical representation of the compound, it is recognised that under commercial conditions the presence of a small proportion of water can hardly be avoided. A limit of 5 per cent. would, however, be ample. If the compound is introduced into the B.P.C., therefore, the formula should be given as $C_7H_7N_4O_2Na.NaCOOCH_3$, and it should be required to contain not less than 60 per cent. of anhydrous theophylline, $C_7H_8N_4O_2$, and not more than 5 per cent. of water.

The work recorded in this paper was carried out in the analytical laboratory of James Woolley, Sons & Co., Ltd., Manchester.

Discussion

The Chairman said this was a short but very valuable paper.

Mr. Corfield, after congratulating the author, said there was no doubt that theophylline sodium acetate in commerce did vary, and it was right that attention should be drawn to it. If the Pharmacopœia Commission included this chemical in the Pharmacopœia as the result of its considerable use in medicine, the paper would be most helpful. He expressed a doubt regarding Mr. Ferrey's determination with iodine, as the results would depend on the complete absence of another substance capable of absorbing iodine.

Mr. Franklin thanked the author for his paper.

The next paper taken was:—

The Quantitative Methylation of Theobromine and Theophylline, and the Determination of these Substances in Theobromine Sodium Salicylate and Theophylline Sodium Acetate

By P. A. W. Self, B.Sc., F.I.C., Ph.C., and W. R. Rankin

[Abstract]

The essential conditions for the conversion of theobromine into caffeine were discovered by the authors some years ago. It is necessary that the proportions of methyl ester and of sodium hydroxide are both in slight excess of theoretical amounts. Further, the two reagents should be present in almost exactly molecular proportions, excess of sodium hydroxide being prejudicial. In practice the reaction is carried out in strong solutions, dimethyl sulphate being convenient and inexpensive. Preliminary experiments show that standing for half an hour in the cold suffices, provided that the mixture is well shaken and that a slight excess or deficiency of dimethyl sulphate does not interfere with quantitative methylation. Under favourable conditions the error does not exceed 0.4 per cent. In applying the methylation method to the determination of theobromine in theobromine sodium salicylate, it is first shown that the presence of sodium salicylate does not interfere with the reaction. Allowance has to be made for the slight excess of soda in fresh samples and a deficit in old specimens. The method and quantities recommended are as follows:—

Dissolve 1 gram of theobromine and sodium salicylate in 10 c.c. of water in a small stoppered flask, add 2 c.c. of $N/1$ sodium hydroxide and 0.6 c.c. of dimethyl sulphate and shake continuously for five minutes. Allow to stand for half an hour, then add 3 c.c. of $N/1$ sodium hydroxide, shake well for one or two minutes, transfer to a separator with chloroform and a little water, and extract the caffeine immediately by shaking with successive portions of chloroform, washing each portion with about 10 c.c. of water contained in a second separator. Evaporate the chloroform, dry at 100° C. and weigh. Each gram of anhydrous caffeine is equivalent to 0.9278 gram of theobromine ($C_7H_8O_2N_4$).

In the case of theophylline the results are slightly lower, this being apparently due to formation of a small proportion of some substance, other than caffeine, which is not readily extractable by chloroform. It is shown that the presence of sodium acetate is not prejudicial in quantitative methylation of theophylline in theophylline sodium acetate. The method suggested is:—

Take 1 gram of the substance, mix with 4 c.c. of $N/1$ sodium hydroxide and 5 c.c. of water, add 0.8 c.c. of dimethyl sulphate and shake continuously for five minutes, or until a clear solution is obtained, and then allow to stand for an hour, shaking frequently. Add 3 c.c. of $N/1$ sodium hydroxide, shake for about two minutes, transfer to a separator with chloroform and a little water and extract the caffeine immediately by shaking with successive portions of chloroform, washing each portion with about 10 c.c. of water contained in a second separator. Evaporate the chloroform, dry at 100° C. and weigh. One gram of anhydrous caffeine is equivalent to 0.9278 gram of anhydrous theophylline ($C_7H_8O_2N_4$).

Summary

The preparation of caffeine from theobromine and theophylline by methylation with dimethyl sulphate is described and the factors governing the conversion have been examined in detail. By observing the detail described, it is possible to obtain a 99.5 per cent. yield of caffeine from theobromine and a 98.0 per cent yield from theophylline. In the case of theophylline the loss may be due to a side reaction which results in the formation of a small amount of a substance soluble in chloroform but not extracted with sodium hydroxide in the same manner as caffeine. The methylation reaction can be used for mixtures and compounds, and detailed processes are described for the determination of theobromine in theobromine sodium salicylate and of theophylline in theophylline sodium acetate.

Discussion

Mr. Ferrey inquired regarding the length of time involved in the determination, and whether the authors had tried the iodine process.

Mr. A. J. Jones wished to know if there was any difficulty in returning the full quantity from the theophylline. Unless one was careful, one seemed to spoil such a process; and it might not be the fault of the process.

Mr. Bull asked how the authors ensured that the product at the end of the reaction was all caffeine.

Mr. Corfield, in reply, remarked that he did not accept full responsibility for the authors' statements. (Laughter.) He had not followed in detail the complete evolution of the process. The authors had tried the iodine process on theobromine and theophylline, but had not got anything like such good results. With the iodine method at least two standard solutions were required; in the authors' method there were no such solutions, and the process was very rapid. Caffeine was easily removed by preliminary treatment. The worker must be satisfied by the usual test.

The Chairman said it was the wish of the meeting to express its thanks to Messrs. Self and Rankin.

The next paper was on

The Resin of Ipomœa (Mexican Scammony Root), its Solubility in Ether and the Acid-Value as a Test for Resin

By C. E. Corfield, B.Sc., F.I.C., Ph.C., and W. R. Rankin

[Abstract]

The value of the determination of the proportion of ether-soluble constituents of the resins of ipomœa, jalap and podophyllum has been the subject of discussion at fairly frequent intervals during the last few years, and in view of the publication of a new British Pharmacopœia it appears necessary that some agreement should be reached with regard to the value of the test and also the conditions under which the test may be applied in order to obtain concordant results. In this paper the authors give the results of their recent experiences on the proportion of ether-soluble constituents of scammony resin, as well as reasons for their opinion that the test in some form should be retained and the conditions under which the test should be applied.

Determination of Ether-insoluble Resins

The ether-insoluble matter of scammony resin is more easily and accurately determined than the ether-soluble. The authors include tables showing the results of some experiments made recently which confirm some of the well-known variations, and the details of the test recommended by which different operators may obtain more consistent results. Below they give the results on three samples of resin, using 1 gm. of the powdered resin in a small, dry, tared, conical flask with 10, 20 and 50 millilitres of ether (0.720); the flask is shaken thoroughly for fifteen minutes and allowed to stand overnight; the clear ethereal solution is poured off, the residue washed with 10 millilitres of ether, and dried to constant weight at 100°.

Sample	1 Per cent. insoluble using 10 millilitres of ether	2 Per cent. insoluble using 20 millilitres of ether	3 Per cent. insoluble using 50 millilitres of ether
A	37.8	40.5	38.1
B	1.9	10.8	15.7
C	14.4	20.6	22.7

These results are in accord with the authors' experience and the experience of others that the solubility may considerably decrease with an increase in the amount of ether used up to 40 or 50 millilitres. With sample A the results show extremely small variations, but B and C show clearly that published figures are useless unless the volume of ether used is stated. If we assume that other factors are more or less equal, it is evident that the figures of Deane and Edmonton, who used 2 gm. in 10 millilitres, would indicate an even lower insoluble content than those in column (1), whilst figures corresponding to those obtained by Dott would indicate percentages of insoluble resin somewhere between those of columns (2) and (3). The authors find that 1 gm. of resin is easily manipulated in 50 millilitres, and understand that these proportions are preferred in certain other laboratories. A table is given also, showing the figures for the percentage of insoluble resin in a number of other samples, all of which have been extracted from different parcels of scammony and tested with 50 millilitres of ether (0.720). The authors believe that the maximum limit of 40 per cent. recommended is a fair one, and will not exclude any appreciable amount of the resin prepared from Mexican scammony of good commercial quality. Experiments show that the test cannot be reliable unless the concentration of the ether is kept within narrow limits. The use of absolute ethyl ether gives quite an appreciable increase in the insoluble resin figure, and the results are in the opposite direction with ether of higher gravity.

Acid Value of the Resins

Colophony is sometimes identified, and its presence in mixtures detected, by its reaction with acetic acid or acetic anhydride and sulphuric acid, and by adding copper acetate solution to a dilute solution in petroleum ether. The absence of colophony in such resins as scammony and jalap may conveniently be maintained by determining the acid value of the resin which in the case of scammony does not exceed 30, whereas the acid value of resin is on the average about 160. The authors give the following table showing results obtained for the acid values of a number of genuine resins calculated with reference to the resin dried at 100°:—

Sample	Per cent. ether insoluble resins	Acid value of ether soluble constituents	Acid value of ether insoluble constituents
1	39.4	29	22
2	39.0	23	17
3	37.8	28	22
4	35.1	25	19
5	34.0	22	25
6	28.9	25	30
7	22.7	23	29
8	14.7	18	27
9	19.5	22	26
10	49.7	30	14

The results in column (2) are obtained, after adding 20 millilitres of neutral alcohol to the ethereal solution and washings from the determination of ether-insoluble resins and titrating with *N*/10 sodium hydroxide, using phenolphthalein as indicator, by deducting the weight of insoluble resin from the 1 gm. taken and calculating the acid value on the difference. The results in column (3) are obtained directly by solution and titration of the known weight of ether-insoluble residue. The results do not indicate any appreciable difference in acidity between the two portions, so that whilst the acid value of the whole resin would clearly indicate the presence of much colophony, the determination on the ether-soluble portion which would include the colophony would provide a more searching test for this adulterant.

Conclusions

Although the value of the determination of ether-soluble solids of scammony or ipomœa resin has been criticised adversely, many laboratories find it useful and worth retaining as a check on the purity of the drug. Owing to the wide variation in results published, and the enormous influence of certain factors on the results, it is essential to fix the conditions of the test, especially the volume and specific gravity of the ether used. The authors disagree with the opinion that the test is of no value. They suggest that 1 gm. of resin with 50 millilitres of ether (0.720) should be used in the test, and that the standard should be in the form of a limit test of not more than 40 per cent. of ether-insoluble resins. Figures for the acid values of several samples are included, and they recommend the determination of the acid value of the ether-soluble portion of the resin as a more searching test for the absence of colophony. (From the analytical laboratories of Harrison & Self.)

Discussion

Mr. **Franklin** said the meeting was indebted to Mr. Corfield for the way in which he had put the subject on the paper.

Mr. **Walmsley** said that in routine tests for detecting moisture he evaporated the ethereal solutions to dryness. Using different samples of ether he did not get such variations as Deane and Edmonton. He inquired as to what would happen in abnormal years when there was no resin to meet the demand.

Mr. **Brewis** inquired if Mr. Corfield had noted any difference in the roots (not reasonably uniform) from which the resin is obtained. Is the ether 0.720 specially dried or that of the Pharmacopœia; also is the scammony resin specially dried? Have the authors determined what the soluble and insoluble resin is? It was difficult to know when to stop washing, and the only way was to adopt an empirical method and to wash for a certain time, as some of that soluble in water is also soluble in ether.

Mr. **Corfield**, replying, said there was not much root that was not genuine. From his experience he was satisfied that parcels vary, but each is in itself uniform. The experiments reported were performed with 0.720 ether and not with that having a range about 0.720. The resin was dried at 100°. The amount of washing was a detail of the process of assay of resin in the root, and therefore outside the scope of the paper.

Mr. **Franklin** expressed the thanks of the meeting for the paper.

The next paper taken was:—

Bismuth Sodium Tartrate and Mistura Bismuthi Composita Acida cum Pepsino

By S. Webster-Jones and A. J. Jones, A.I.C., Ph.C.

[Abstract]

A good deal of work has been done in the past, in connection with the combination of bismuth with both citric and tartaric acids, in the endeavour to sort out the true salts from the complex mixtures of salts which often result from a reaction and to establish the exact molecular constitution of the simpler substances. What the pharmacist requires is, not a substance of some particular space lattice configuration in the molecule, but one that will give a satisfactory 'Mistura." This paper is an attempt to provide such a preparation. In spite of the publication of the work of Corfield and Adams on the composition of the tartrates of bismuth, it was impossible to obtain in 1930 consistent supplies of bismuth sodium tartrate that would behave satisfactorily in the "Mistura." It was usual to find that the salt would not dissolve completely in water, that if it dissolved it often flocculated with the other ingredients of the mixture, or else, forming an immediately presentable mixture, it would produce an unfilterable precipitate on standing. The value of bismuth sodium tartrate is that it provides a means of dispensing bismuth in conjunction with pepsin in an acid medium, which is a necessary condition for preserving the activity of the pepsin in a way that no other salt of bismuth so readily provides. If the salt be set at an acidity of 10 per cent. then it will produce a mixture of from 0.9 to 1.0 per cent. acidity, which seems a reasonable degree. In deciding what type of bismuth tartrate was most suitable, the work of Corfield and Adams was of the greatest assistance. A salt approximating to a bismuth-tartaric ratio of 1 : 2—$Bi_2(C_4H_4O_6)_3.H_2C_4H_4O_6$—gave best results, and it was on this basis that practice was developed.

The Process

Twenty lb. of bismuth metal is dissolved in a mixture of 2 gallons of nitric acid (s.g. 1.42) and 1½ gallons of water. The hydrate is precipitated by pouring this liquor, slowly and with constant stirring, into a solution of 9 lb. of caustic soda in 10 gallons of water, the caustic soda thus being in slight excess. The hydrate is washed with water, by decantation, until free from all but traces of nitrate. To the freshly washed and well settled hydrate 32½ lb. of tartaric acid is added and the whole well mixed. The mixture thickens as the reaction proceeds, and should be stirred continuously until thickening ceases. It is then allowed to stand for two or three days, or until a test sample withdrawn from the bulk gives a practically clear solution on adding caustic soda, the solution still remaining acid. The digestion having thus been shown to be complete, a solution of 10 lb. of caustic soda in 3 gallons of water is added very gradually to the whole batch, and with efficient stirring, until the bismuth tartrate is just dissolved, leaving an acid liquor. There is usually a trace of insoluble matter which may leave the solution somewhat cloudy: it is probably a little subnitrate of bismuth precipitated with the hydroxide, but it is easily removed either by settling or by filtration. The acid liquor is assayed for total solids and the acidity is then adjusted by adding caustic soda so as to give approximately 10 per cent. of "free acid" calculated on the weight of double tartrate in the batch. Having adjusted the acidity the liquor is then decolorised by charcoal, filtered and carefully evaporated to a very thick syrup in a steam pan. The syrup is transferred to trays where it cools and sets to a brittle solid. This can afterwards be ground to powder or otherwise dealt with. For the B.P.C. mixture it is not really necessary to prepare the powder; stopping at the liquor stage, all that is necessary is to standardise to a given strength, and there is at once a solution ready for dispensing in the mixture. (An analysis of the solids product is given.)

The work involved in this paper was carried out in the laboratories of Evans Sons Lescher & Webb, Ltd., Liverpool.

Discussion

The **Chairman**, in opening the discussion on the paper, which he described as a very valuable pharmaceutical one, remarked that a preparation should not be dropped because it was troublesome.

Mr. **Bennett** congratulated the authors on tackling a thorny subject. There was some change in the salt in the process of scaling and powdering.

Mr. **Rae** asked whether the salt tended to become insoluble on keeping.

Mr. CORFIELD inquired if this tartrate was used to any appreciable extent for any other purpose. If not, he suggested it should no longer be described officially; all that was wanted was a liquor for the mixture. If the solid substance was dropped, however, there would still be a demand for it. Preparations with different percentages of bismuth content might be equally satisfactory.

Mr. JONES, replying on the points raised, said that the results with a salt of higher bismuth content were not satisfactory. For pharmaceutical purposes a liquor was all that was necessary, but a salt might still be convenient for sale. The salt referred to in the paper evaporated well with care. He believed that the preparation kept for a long time.

The CHAIRMAN, in thanking the authors, added that the Codex revisers should find a new formula for this mixture.

The next paper taken was on

Pale Cresylic Acid and Lysol

By NORMAN GLASS, A.I.C., and A. J. JONES, A.I.C., Ph.C.

[ABSTRACT]

THE work embodied in this paper was carried out with the primary intention of selecting acids suitable for use in the manufacture of lysol from the many sources available, and, at the same time, ascertaining the relations between the properties of the cresol and the lysol made from it. It is generally recognised in the trade that lysol should contain 50 per cent. of cresol by volume. There appears to be little information as to the optimum limits within which the percentage of fatty acids should fall. The most characteristic property of a good lysol is its solubility in water, and failure of samples in this respect may be due to any of the following causes:—(1) Insufficient soap; (2) inferior cresol; (3) too much soap; (4) peculiarities in the composition of the cresol. Points 1 and 2 call for little comment. With conditions 3 and 4 any trouble on dilution takes the form of a thick jelly when about $1\frac{1}{2}$ volumes of water have been added to the lysol, and the jelly may sometimes be clear and sometimes a thick, turbid mass. It was with the object of finding a reason for this gelatinisation and immiscibility that an investigation of a number of commercial samples of high-grade cresols was undertaken.

The samples were examined in regard to—(1) The properties of the lysol made from the cresol; (2) the impurities; (3) the solubility in caustic soda solution; (4) the boiling-point graph; (5) the percentage of meta cresol. (1) In making the lysol the procedure was standardised by using a linseed oil soap specially made for the purpose, in which the fatty acids were determined, and a definite weight taken, such as was considered the most suitable for the series of tests. 50 c.c. of cresol were added to the standard amount of soap and solutions effected in the cold. The mixture was then adjusted to 100 c.c. with distilled water, thus giving a lysol containing 50 per cent. of cresol by volume. Two dilution tests were employed: first, the addition of 1 or 2 c.c. of the sample to 100 c.c. of water, which test will reveal any excessive impurities in the cresol (principally hydrocarbons), and it also detects improper saponification of the oil, either defect causing the mixture to be cloudy. The second test consisted in taking 10 c.c. of the lysol in a 100-c.c. cylinder and adding water at the rate of 1 or 2 c.c. at a time, with efficient mixing, up to a volume of 30 c.c or more, the dilution being then continued to 100 c.c. Unsatisfactory samples will give a thick jelly or an opaque emulsion when the volume of the mixture is in the region of 25 or 30 c.c., but they will clear at the 100 c.c. dilution. The temperature is important in this test. The samples which were incorrect at 13° C. were found quite satisfactory when warmed to 15° C. The latter temperature was adopted at standard. (2) The hydrocarbons and bases were estimated, using the apparatus and technique laid down in "Standard Methods of Testing Tar and Tar Products." Our findings were in agreement with the makers' specifications. (3) For the solubility in caustic soda, 5 c.c. of the cresol were added to 10 c.c. of 20-per-cent. caustic soda solution in a 100-c.c. cylinder, and this mixture diluted first to 50 c.c. and then to 100 c.c., noting any difference between the two dilutions. The state of clarity and odour should be noted. In the samples examined there were distinct differences in odour, and with one sample minute crystals of naphthalene separated on dilution; but in most cases odour remained a matter of personal opinion, and one had to decide between a slight naphthalene odour and a slight tarry or sulphur compound smell. (4) 50 c.c. of the sample were distilled according to the standard method and a graph drawn from the results obtained. (5) The meta cresol was estimated by the method of Raschig, as modified by Fox and Barker. This method worked very well on the whole, and as comparative figures alone were required no attempt was made with other methods. (The authors give a table dealing with the boiling-point range of the cresols examined as well as the meta cresol content.)

All samples were of high-grade quality. Further comparison of the figures shows that both high boiling fractions and high meta cresol content cause gelatinisation of lysol, and that the two factors have an additive influence. When high meta content is the only factor the effect is intensified by high soap percentage. In some of the earlier experiments, before the importance of the relationship between fatty acids and meta cresol content had been thoroughly appreciated, one or two samples were rejected which were afterwards found to give perfect miscibility when the proportion of fatty acids had been reduced. When the higher boiling complex is the cause of the trouble, however, reduction of soap percentage has very little effect. If it be decided that a standard lysol must give a limpid and clear solution at all dilutions with water, then something more is wanted for the definition of the composition of the standard cresol than is provided by the mere statement that a certain portion shall distil between two limits of temperature. On the other hand, if dilution effects are not considered to be so important, then a much greater variation in the composition of the standard cresol can be admitted. In a few cases the main fractions of the distillate were examined and although no startling separation was to be anticipated from a single distillation, yet some interesting figures were obtained. (The authors give a table.)

SUMMARY

Whilst the obvious way to find out the suitability of a cresol is to make some lysol from it, the significance of its behaviour may be found by a consideration of the fractional distillation and the percentage of meta cresol. The present standards fail to appreciate the effects produced by the composition of the cresol, and while a standard of 80 per cent. distilling between 195° and 205° C. is quite reasonable for a good quality cresol, it affords no criterion of its behaviour as a constituent of lysol. The presence of fractions boiling at above 205° C., the proportion of meta cresol present, the ratio of meta to high boiling point fraction, and the relative proportion of fatty acids to meta cresol are all of material consideration in attempting to standardise both cresol and lysol.

The work involved in this paper was carried out in the laboratories of Evans Sons Lescher & Webb, Ltd., Liverpool.

DISCUSSION

The CHAIRMAN, in opening the discussion, pointed out that lysol was probably the most used antiseptic in this country, and that cloudiness was rather objected to. He thought this effect was due to the oil used, and the formula in the British Pharmaceutical Codex could be improved in this connection.

Dr. CROSSLEY HOLLAND said the paper was likely to lead to the practical solution of several difficulties regarding lysol. Referring to tests, he called attention to the irritation caused by some preparations, and suggested that this was not necessarily due to the cresol used, but possibly to the soap. As to the appearance, if the solution was very opaque there was danger of its obscuring or changing diseased tissue—apart from the difficulty of seeing instruments immersed in the disinfectant. It was highly desirable to have a clear solution and to reduce irritability.

Mr. Short called attention to the difference in colour and odour of cresols of a few years ago compared with more recent products. A sample he had lately had was tarry and water-white, and claimed to be purer. On keeping this cresol for from six to twelve months the aroma improved.

Mr. Bull said the higher-boiling cresols were of greatest value from a disinfectant point of view. There was much to be said regarding adjusting the lysol, and irritation may be due to alkalinity. The change of colour and odour had now been overcome. It was due, he thought, to pyridine or sulphur.

Mr. Boyes suggested that the cloudy appearance on dilution was conditioned by the hardness of the water used.

Mr. Jones said the limpidity of the solution, high-boiling fraction and soap were the variables. Regarding irritation he was not competent to make a suggestion, but the soap-cresol ratio had something to do with the effect on the skin. Cresol distillers say they are dependent on the tar, and as that varies so do the cresols. The high-boiling fraction will not give the dilution desired, and hard water does upset things.

The last paper taken at this session was:—

The Systematic Qualitative Analysis of Vegetable Powders and Extractives

By Alan H. Ware, Ph.C., and Victor Smith, M.Sc., A.I.C., Ph.C.

[Abstract]

This paper is the second of a series constituting a coordinated scheme commencing at last year's Conference. The ultimate object is to assign rapidly an unknown substance to one or another of certain primary division or groups and thence into some thirty distinct classes. The character of the subject-matter is such as to preclude the salient features being adequately summarised, since the details of tests and the schematic tables necessitated reference to original papers. Indeed, the characters of the above classes are reserved for later communication as well as lists of vegetable products of commercial importance contained therein. Hence this survey outlines briefly the four sections additional to Part I of the scheme previously published.

II.—An "omnibus" method of testing for emodin, æsculetin and allied bodies, alkaloids, chlorophyll, etc., relies upon extraction with a special solvent after mixing the vegetable powder with sufficient strong solution of basic lead acetate to moisten it thoroughly. The solvent consists of a mixture of one part each of iso-amyl alcohol and carbon tetrachloride with three parts of chloroform. Extractives (concentrated if necessary) may be absorbed by powdered quassia. The moist lead subacetate mixture, after standing for two minutes, is rubbed out with 6 c.c. of the special solvent. The extractive thus obtained is filtered through a small filter-paper moistened with solvent and the residue washed with solvent to make 6 c.c. of filtrate. The filtrate is divided into two equal parts. One portion is gently agitated with 2 c.c. of ammonia solution (10 per cent.). Emodins and related bodies produce pink, red or rose-purple colorations. In absence of coloration, fluorescence after dilution with water (4 c.c.) indicates æsculetin or related substances. The second portion is shaken out with 3 c.c. of dilute hydrochloric acid (10 per cent.), and after noting the appearances of the two layers, the separated acid layer is tested for alkaloids by adding Dragendorff's reagent drop by drop.

III.—Extends the formaldehyde test to the examination of vegetable extractives. The principle underlying the procedure is that phlobatannins yield condensation products insoluble in warm alcohol and unaffected by hot aqueous potassium hydroxide solution (5 per cent.). The test method consists of adding to 6 c.c. of extractive (of suitable strength) 5 drops of formaldehyde solution (40 per cent.) together with 6 drops of dilute hydrochloric acid (10 per cent.). The mixture is heated to boiling and then cooled, and the process is repeated once more if there is no precipitate. The production of a green (or blue) coloration in the precipitate by treatment with hot aqueous potassium hydroxide solution (5 per cent.) is of considerable classificatory value, since response is indicative of phlobatannin extractives.

IV.—The test with ferrous sulphate, Rochelle salt, etc., is used in the primary grouping of extractives. The authors refer the reader to the original paper for details of the tests. In particular ferrous sulphate furnishes a specific test for pyrogallol-tannins (non-phlobatannin).

V.—A systematic scheme of analysis is begun. Plant products are grouped primarily into phenol-containing substances and those free from phenolic bodies. The latter are again subdivided into alkaloid-containing and alkaloid-free extractives. The present paper deals only with one of the six groups of Subdivision I of Division A (negative emodin test) of Category I (phenol-containing substances).

Discussion

Mr. Wallis, after thanking the authors for their presentation of so considerable a mass of material, remarked that this problem of vegetable substances wanted attention. It was difficult to get a clear-cut picture, to form a scheme in one's mind. One difficulty probably arose from the wide distribution of phenolic bodies. Was the use of quassia as an absorbent altogether wise? Possibly diatomaceous earth or wood-wool was better. Reliance on one general reagent might be uncertain.

Mr. Ware, in reply, said that phenolic bodies were not only widely distributed, but also easily distinguished. The authors' tests enabled them to divide their substances into three classes and a number of subclasses very quickly. He thanked Mr. Wallis for his suggestion as to diatomaceous earth, and pointed out that the use of Dragendorff's reagent was purely a preliminary test.

The Chairman, amid applause, thanked the authors, and declared the proceedings adjourned to the next day.

Science Section

Wednesday Morning

When the Science Section met on Wednesday morning, the senior general secretary (Mr. C. E. Corfield) announced that, acting on medical advice, the Chairman of the Conference would not attend the meeting. Mr. R. R. Bennett had consented to take the chair in place of Mr. Franklin. (Applause.)

The first paper taken was on

The Volumetric Assay of Lactic Acid, B.P.

By Harry Brindle, B.Sc., F.I.C., Ph.C.

[Abstract]

The Pharmaceutical Chemistry Subcommittee on Pharmacopœia revision has suggested some modifications in the official process for the assay of lactic acid. It is recommended, in the first instance, that no attempt should be made to determine the lactic acid, as distinct from other substances, usually called "lactide," which are capable of reacting with caustic soda solution. In view of the writer's experience this is an improvement. The committee recommends that an excess of *N*/1 NaOH be added, and the excess titrated after boiling gently for twenty minutes. In the writer's experience the fifteen minutes' boiling recommended by the 1914 B.P. was much longer than necessary, and it was surprising to see a proposal to increase the time to twenty minutes. Experiments were undertaken to determine if the process could be simplified by reducing the period of boiling. In each case no attempt was made to distinguish between lactic acid and "lactide," as it is very difficult to obtain consistent results, and no useful purpose would be served by giving them. Three samples of lactic acid from different sources were used. The results are tabulated by the author.

A consideration of all the results will show that, if B.P. lactic acid be allowed to stand at ordinary laboratory temperature for a period which need not be longer than half an hour, consistent results are obtained for the volumetric assay of the total acidity. With some samples the reaction is complete in a much shorter time than half an hour. The results obtained by this process, in some cases, are exactly the same as those obtained by prolonged boiling and, in any case, are not more than about 1 per cent. less. The explanation of this probably lies in the fact that the so-called "lactide" really consists of lactyl lactic acid and true lactide and possibly traces of other acid derivatives, and that the proportions vary somewhat in different samples. The difference between different samples, however, is so slight as to be negligible for practical purposes; and the determination of the total acidity in the cold has so much to recommend it that the writer has no hesitation in strongly recommending this process for adoption in the forthcoming Pharmacopœia. In any case, if a process involving boiling is desired, there is no necessity to boil for more than five minutes, as this gives results which are identical with those obtained by longer boiling. (From the Pharmaceutical Department, University of Manchester.)

DISCUSSION

Mr. WALMSLEY remarked that the 1914 British Pharmacopœia was in advance of the 1898 edition. The lactide was a disturbing factor.

Mr. FERREY confirmed Mr. Brindle's statement as to the B.P. instructions.

Mr. BRINDLE thanked the speakers for their comments, and proceeded to give an account of his research on

Calcii Lactas Recens

By HARRY BRINDLE, B.SC., F.I.C., PH.C.

[ABSTRACT]

CALCIUM LACTATE is now preferred by many prescribers when a calcium salt is required. It is frequently prescribed in mixtures and, because of the varying solubility of the commercially available article, a clear solution or a mixture containing varying amounts of calcium lactate in suspension may result when the same prescription is dispensed by different pharmacists or even by the same pharmacist with different samples of calcium lactate. Some prescribers attempt to overcome the difficulty by ordering calcii lactas recens, expecting the dispenser to prepare the calcium lactate extemporaneously from calcium carbonate and lactic acid. The calculation of the proportions of calcium carbonate and lactic acid to use is invariably left to the dispenser. None of the standard text-books consulted gives any information on the method to be adopted, either for the calculation or the dispensing of the preparation. References in current literature are few and misleading, if not actually erroneous. It is undesirable to leave the lactide uncombined if it can be made to react with the calcium carbonate, since it is really a foreign ingredient in the mixture, and will constitute about 10 per cent. of the calcium lactate present. Further, a portion of this lactide will slowly change into lactic acid on keeping.

EXPERIMENTAL

The only suitable materials from which to prepare calcium lactate appear to be calcium carbonate and lactic acid B.P. An excess of the former can then be used, and it will be certain that all the lactic acid will be neutralised. In all the experiments a 10-per-cent. w/v solution of B.P. lactic acid was used and 20 mils of the solution was allowed to interact with 2 grams of calcium carbonate (precipitated). After the varying conditions of temperature and time had been complied with the solution was made up to its original weight, a further 20 mils of water added and the mixture filtered from the excess calcium carbonate through a dry filter; 20 mils of the filtrate (=1 gram of the original lactic acid) was then boiled for fifteen minutes with excess of $N/2$ NaOH and the excess of alkali titrated with $N/2$ H_2SO_4 using phenolphthalein as indicator. In this way the NaOH saponifiable substances, hereafter called "lactide," unneutralised by the calcium carbonate, were determined. 10 mils of the original 10 per cent. lactic acid solution after neutralising the free lactic acid with NaOH required 3.25 mils of $N/2$ NaOH to saponify the "lactide," corresponding to 11.37 per cent. of "lactide" calculated as $C_6H_8O_4$, assuming that under the conditions one molecule of lactide forms two molecules of lactide acid. (The author's results are tabulated.)

PRACTICAL APPLICATION OF RESULTS

Some hours' boiling with calcium carbonate would be necessary to change all the lactide into calcium lactate. In the presence of a 10-per-cent. solution of B.P. lactic acid calcium carbonate will decompose all the lactic acid and 75 per cent. of the lactide after twenty minutes' gentle boiling. The best method to use for the calculation of the quantities would be to add to the lactic acid a known weight of calcium carbonate and after the reaction to wash, dry and weigh the residual carbonate and from this calculate the weight of calcium lactate formed. This process was considered too prolonged for use at the dispensing counter. Since the B.P. allows calcium lactate to contain as low as 93 per cent. of pure calcium lactate, $Ca(C_3H_5O_3)_2 5H_2O$, the variability of lactic acid is not serious. It is proposed to demand a minimum total acidity of 87.5 per cent. calculated as lactic acid in the forthcoming B.P. If the acid supplied is assumed to be of this strength, then the small amount of lactide left undecomposed after twenty minutes' boiling with calcium carbonate will be almost exactly compensated by the 1- or 2-per-cent. excess of total acidity. The following process, therefore, is arrived at for the extemporaneous preparation of calcii lactas recens:—

From the equation:

$$\underbrace{CaCO_3}_{100} + \underbrace{2CH_3CHOHCOOH}_{180} = \underbrace{(CH_3CHOHCOO)_2Ca+CO_2}_{218}$$

100 grams of calcium carbonate react with 180 grams of real lactic acid to produce 218 grams of $(CH_3CHOHCOO)_2Ca$, which is equivalent to 308 grams of 100-per-cent. B.P. calcium lactate $(CH_3CHOHCOO)_2Ca.5H_2O$. Assuming that B.P. lactic acid has an available acidity equal to 87.5 per cent. of lactic acid, 308 grams of B.P. calcium lactate require $\frac{180 \times 100}{87.5 \times 1.21}$ mils of B.P. lactic acid = 170 mils ∴ 100 grams calcii lactas recens require for preparation 55.2 mils of B.P. lactic acid and 32.5 grams of calcium carbonate. An excess of calcium carbonate is required; therefore the following process is suggested:—

Precipitated calcium carbonate 50 grams (or grains), lactic acid B.P. 55.2 mils (or 61 minims). Dilute the lactic acid with about ten times its volume of water, add the calcium carbonate gradually, boil gently for twenty minutes, filter, wash the filter paper and contents with a little water and add the washings to the previous filtrate. A solution results which contains only a trace of undecomposed lactide. (From the Pharmaceutical Department, University of Manchester.)

DISCUSSION

The CHAIRMAN pointed out that the frequency of prescribing calcii lactas recens varied greatly between different parts of the country. The commercial salt varied in solubility, and effloresced if kept in a warm place.

Mr. Davis remarked that the formula worked out by Mr. Brindle would be useful in hospital work.

Mr. Rae inquired why the salt decomposes with an offensive smell.

Mr. Ferrey said he had noticed two types of smell from decomposing calcium lactate. (Laughter.)

Mr. Wokes observed that he had found, in recent experiments, that the addition of sodium lactate in molecular proportion increases the assimilability of calcium in the body.

Mr. Gamble asked whether Mr. Wokes had tried any other addition to calcium lactate for the same purpose—e.g., lactose.

Mr. Wokes: No.

Mr. Grier remarked that a proprietary tablet containing calcium lactate was palatable, but a non-proprietary tablet was not. Was a decomposing albumin the explanation?

Mr. Brindle, in reply, suggested that the offensive smell, or smells, referred to might be due to butyric fermentation. The lactic acid had been boiled, and it was hardly likely that any albumin was left.

The Chairman thanked the author for his papers.

The next paper taken was on

Factors Influencing the Stability of Hypochlorite Solutions and a proposed Formula for a Modified Dakin's Solution

By H. Davis, B.Sc., A.I.C., Ph.C.

[Abstract.]

The most popular hypochlorite solutions in general use are eusol and Dakin's solution, but when prepared in accordance with the directions of the B.P.C. they do not yield uniform products. Both are looked upon as unstable products. Experiments were first made in order to determine the various factors which influence the rate of decomposition. Preliminary experiments were made with eusol prepared according to the formula of the British Pharmaceutical Codex as the test solution. The following results (in c.c.) were obtained among others:—

Date	In stoppered white glass vessel	In stoppered non-actinic glass vessel	In unstoppered non-actinic glass vessel	Stored in vessel in ice
February 4, 1931	13.80	13.80	13.80	13.80
February 9, 1931	10.00	10.00	9.80	11.35
February 16, 1931	6.60	6.60	6.40	8.00

The readings in the above table and in all succeeding tables are the quantities of decinormal solution of sodium thiosulphate required to decolourise 10 c.c. of the hypochlorite solution after mixing with 1 gram of potassium iodide and acidifying with 4 c.c. of acetic acid (B.P.). The containing vessels were placed on the shelves of the laboratory under conditions obtaining in the average dispensary. The outstanding feature of these results is to show that the dominating factor in the rate of decomposition is temperature. With more efficient cooling eusol, maintained at 0° C., gave the following results:—

Days	Reading	Days	Reading
—	17.35	Three	16.40
One	17.00	Seven	15.00

A sample of Dakin's solution was next prepared in accordance with the formula of the British Pharmaceutical Codex and the rate of deterioration noted under precisely similar conditions.

Date	In stoppered white glass vessel	In stoppered non-actinic glass vessel	In unstoppered non-actinic glass vessel
February 4, 1931	16.20	16.20	16.20
February 13, 1931	16.15	16.15	16.15
February 18, 1931	16.05	16.10	16.15

The relative stabilities of eusol and Dakin's solution were next compared at elevated temperatures. Solutions were maintained at a temperature of 55° C. in wide-mouthed unstoppered flasks and titrations made at intervals.

Time	Eusol	Dakin's
	C.c.	C.c.
—	9.80	16.50
One hour	8.65	15.50
Three hours	6.00	16.45
Four hours	5.05	17.20
Five hours	4.50	18.40

The amount of available chlorine in eusol rapidly diminished, whereas, after a fall during the first hour, it actually increased in Dakin's solution. This clearly indicated that the slight fall which occurred was more than counterbalanced by the evaporation of the solvent. Owing to the behaviour of these solutions it was decided to investigate the effects of boiling the solutions in flasks fitted with reflux condensers, thus eliminating the effect of evaporation. (The author tabulates his results.) It would appear that, other conditions being equal, preparations of sodium hypochlorite yield more satisfactory products than those of calcium hypochlorite.

The chief drawback to the use of a solution hypochlorite lies in its excessive alkalinity. Being a combination of a weak acid and a strong base sodium hypochlorite undergoes hydrolysis in solution. Dakin gives a detailed account of this, and suggested the addition of boric acid. Determinations of PH, using indicators, proved to be unsatisfactory. Determination of PH by means of the glass electrode appeared to be the only satisfactory solution to the problem. The PH of Daufresne's solution was 10.23; Dakin's was PH 9.71.

Investigation of Formula

The course of procedure next adopted was to devise a formula which would yield a uniform product without assay of the solution, be relatively stable, and have a PH value as near 7 as possible. Bleaching powders containing from 30 to 35 per cent. of available chlorine were first to be considered. Smaller amounts of the stronger samples would necessitate the use of correspondingly smaller quantities of sodium carbonate and boric acid. Was there any relationship between the percentage of available chlorine and the calcium (calculated as oxide) present? Numerous commercial samples of bleaching powder were submitted to analysis. (A table is given in the paper.) It was quite evident that no definite relationship existed. The quantities of sodium carbonate and boric acid were therefore calculated, by simple proportion, from the percentage of available chlorine in the sample.

Further experiments were performed to obtain a formula which would yield a less alkaline solution than that of the B.P.C. The following formulas were devised:—

Percentage of available Cl in chlorinated lime	Quantities for one litre of solution		
	Chlorinated lime	Sodium carb. xtal.	Boric acid
	Gm.	Gm.	Gm.
30	18.8	37.6	4.00
31	18.2	36.4	3.87
32	17.6	35.2	3.75
33	17.1	34.2	3.64
34	16.6	33.2	3.53
35	16.1	32.2	3.43

Percentage of available Cl in chlorinated lime	Quantities for one litre of solution		
	Chlorinated lime	Sodium carb. xtal.	Boric acid
	Gm.	Gm.	Gm.
30	18.8	37.6	8.00
31	18.2	36.4	7.74
32	17.6	35.2	7.50
33	17.1	34.2	7.28
34	16.6	33.2	7.06
35	16.1	32.2	6.86

The PH values of the solutions determined by the glass electrode method were:—

Formula 2: PH 9.53. Formula 3: PH 8.66

It is obvious that, owing to the buffering action of the borates present, an excessive amount of acid would be required to produce a solution of PH (eusol in which equal quantities of bleaching powder and boric acid are used possessed a PH value of 7.21). The next investigation involved a study of the influence of PH on the stability of the solutions. (The results obtained are given in a table). The results show that the PH value of the solution is a factor which exerts a marked effect on the stability. As a result of these experiments [the first] formula is suggested as a suitable formula for a solution of sodium hypochlorite with boric acid. The product thus prepared combines stability with approximate neutrality. A suggested monograph for the Pharmacopœia would utilise this formula and allow limits of 0.5 and 0.55 per cent. of available chlorine.

Method of Preparation.—Dissolve the sodium carbonate in the water, add to the previously powdered bleaching powder with constant trituration. Transfer to a suitable vessel and shake occasionally during a period of twenty minutes. Allow to stand for a further period of ten minutes, decant and filter through a bleached filter. To the clear filtrate add the boric acid and shake until dissolved. Keep in a cool place, protected from light.

Over a period of upwards of three months solutions prepared from the above formula have been used in the University College Hospital to the exclusion of eusol. No difference has been observed between the clinical results obtained from the use of this and those obtained from freshly prepared eusol. The solution should not be administered by the intravenous route. Owing to the widespread use of the mixture of equal weights of powdered chlorinated lime and powdered boric acid, which is known as eupad and of chloramine T, experiments were made to investigate the stability of these. The powder was stored in a screw-topped container of amber-coloured glass. In forty days the loss in strength was 14.2 per cent. This represented the stability under ideal conditions of storage, particularly as the container was only opened on three occasions during the whole period. The stability of a solution of chloramine T was next considered. The solution used was approximately equivalent in strength to that of Dakin's solution. The figures obtained showed no fluctuation over a period of six weeks when the solution was stored in a container in a cool dark place. The PH of a one-per-cent. solution, determined by the glass electrode, was 10.05. In this concentration it is thus slightly more alkaline than Dakin's solution. It is more expensive when used on a large scale, but it possesses the advantages of being stable in the solid state and of being capable of compression into tablets.

SUMMARY

(1) The stabilities of the common hypochlorite antiseptics have been compared under various conditions.

(2) On the grounds of cheapness and stability a modified Dakin's solution is suggested as suitable for inclusion in the Pharmacopœia.

(3) The PH values of the hypochlorite solutions in common use have been determined, and compared.

(4) The influence of temperature, PH and light on the stability has been investigated.

Professor C. C. Choyce and Dr. P. M. Tookey Kerridge are thanked for assistance.

DISCUSSION

Mr. BENNETT, in opening the discussion, pointed out that this useful work had been undertaken at the request of the Pharmacopœia Commission, and expressed the opinion that there would be a formula for Dakin's solution in the next edition of the Pharmacopœia.

Mr. WALMSLEY said the author's work confirmed his own experience of eusol and Dakin's solution. He had found that the former decomposes rapidly and that light plays an important part. In Dakin's solution which has been kept for twelve months the loss was almost *nil*.

Mr. FOURACRE characterised this as valuable work, and asked if it was owing to its unstable nature that eusol acted so quickly on the surface to which it was applied.

Mr. BRINDLE said in experiments in Manchester they had found that Dakin's solution kept in white glass bottles decomposes more quickly than that stored in amber glass.

Mr. CORFIELD inquired if the author had compared Dakin's solution prepared from bleaching powder with a solution prepared electrolytically.

Mr. DAVIS, in reference to Mr. Brindle's experience, said the samples referred to in the paper had been stored in the dispensary in order to be kept under normal conditions, and he did not regard a position in sunlight such as would be adopted in the pharmacy. Temperature, Mr. Davis considered, played a more important part than light. He could not say if Mr. Fouracre's suggestion was correct, and he had no experience of solutions prepared by electrolysis.

The next paper taken was:—

Tinctura Cocci

By JOHN RAE

[ABSTRACT]

DURING the course of some experiments on compound tincture of cardamoms the idea occurred to the author that a tincture made from defatted cochineal would probably be free from the unsightly flaky deposit. Cochineal is said to contain about 10 per cent. of fat and 2 per cent. of wax. In order to test this theory 4 oz. of cochineal was powdered, and passed through a No. 40 sieve. For purposes of control ½ oz. of this powder was used to make a sample of tincture as directed by the B.P. 1914. The remaining 3½ oz. was packed in a small glass percolator, and macerated with 6 fl. oz. of petroleum spirit for twenty-four hours; percolation was then allowed to proceed, using in all 20 fl. oz. of the menstruum. A little of the fluid taken from the orifice of the percolator was then evaporated on a glass slide, and as only a very slight trace of fat remained it was concluded that practically all of the fat had been removed. The cochineal was then taken out of the percolator, spread on a tray, and dried at a low temperature until free from smell. It was again powdered, and thoroughly mixed. Two sample batches of tincture were prepared as follows:—*Sample A*, cochineal (defatted) ½ oz., alcohol (45 per cent.) 5 fl. oz.; *Sample B*, cochineal (defatted) ½ oz., alcohol (25 per cent.) 5 fl. oz. These were macerated for seven days, shaking periodically, and filtered. Two other samples C and D were prepared using defatted cochineal, and the same strength of alcohol as A and B respectively, but in this case the cochineal was macerated for twelve hours with water, which was added boiling; the quantity used being the amount necessary to dilute the 90-per-cent. alcohol to 45 and 25 per cent. The necessary quantity of 90-per-cent. alcohol was then added, and maceration continued for seven days, when they were filtered. Two further samples, E and F were prepared similar to A and B, but with the addition of 10 per cent. of potassium citrate. 0.5 c.c. of each of the samples prepared was diluted with distilled water to 50 c.c. in a Nessler cylinder. Taking the B.P. tincture as standard, those made from the defatted cochineal were very much darker in colour. Samples E and F gave a purple tint when diluted. It was decided that the addition of potassium citrate was undesirable, and it also introduced a substance which was hardly expected in a simple tincture. In order to obtain a better idea of the relative strengths of the diluted tinctures one c.c. of $N/10$ sulphuric acid was added to each Nessler cylinder and the colours, which were a deep orange, matched against the B.P.

tincture as standard. (The author gives a table.) The fact that sample C matched sample A, and sample D matched sample B shows that the use of boiling water does not increase the amount of colouring matter extracted. It is clear that the best formula is B, made by macerating defatted cochineal with 25 per cent. alcohol. Made in this way the tincture is a dark deep red colour and, so far, has remained free from deposit after six weeks. The B.P. tincture made as a control deposited in three days the familiar flaky deposit which has increased on storage. The following two mixtures were made up:—

Sodii bicarb.	ʒj.
Tr. cocci (sample B)	♏x.
Aq. dest. ... ... ad	℥iv.

Acid. hydrochlor. dil.	ʒj.
Tr. cocci (sample B)	♏x.
Aq. dest. ... ... ad	℥iv.

Both were satisfactory, the alkaline one having a fine rich colour, while the acid one was a deep orange; both were superior to controls made with the B.P. tincture.

This communication is from the laboratories of Clay & Abraham, Ltd.

Discussion

The Chairman, in inviting discussion, remarked that the Conference would not be a normal one without some reference to compound tincture of cardamom. (Laughter.)

Mr. Gamble inquired whether Mr. Rae had tried the effect of cold storage on tincture of cochineal.

Mr. Rae replied that he had not; a control tincture, however, deposited in three days at ordinary laboratory temperature.

The author was thanked by the Chairman.

The next paper was

Variations in Potency and Total Solids of Tinctures of Digitalis

By Frank Wokes, B.Sc., F.I.C., Ph.C.

[Abstract]

From time to time efforts have been made by analysts, when dealing with tinctures or extracts of potent drugs whose active principles cannot yet be determined chemically, to estimate the value of these tinctures from the proportion of total extractive which they contain. Some have even gone so far as to suggest limits of total extractive for such tinctures, based on their determination of this figure in a small number of samples, without producing any evidence that the total extractive is in any way related to the therapeutic value. In this paper an attempt is made to show the danger of such a procedure, by means of data on tinctures of digitalis.

No. of tinctures	Range of potency	Average potency	Average total solids
6	49—73	61	2.47
26	76—99	89	3.13
41	100—125	110	3.40
27	127—200	151	3.28
Average of all tinctures 113			3.24

These average figures show in the first three groups a gradual rise in total solids with increase in potency, but it is not proportional to the increase in potency, and does not continue in the fourth group, containing tinctures whose potency was more than 125 per cent. of that of the standard. The average of total solids increases rapidly with increase of potency in the weak tinctures below 75 per cent., more slowly in the tinctures between 75 and 110 per cent., and comes to a level at about 110 per cent., so that for all tinctures above this potency the average of the total solids is the same. Thus the total extractive for tinctures more potent than the standard tincture bears no relation whatever to the potency. Can a lower limit for total solids be justified? It is true that in the tinctures with a potency below 75 per cent. there seemed to be some relationship between potency and total extractive. But there are tinctures of satisfactory potency whose total solids are as low as those of tinctures of unsatisfactory potency. The experimental error on the determinations of total solids was less than 1 per cent. The experimental error on the biological assays was larger.

Variation in Batches Made from the Same Leaves

It may be asked, "What variation in the total solids may be expected to occur in different tinctures prepared from the same batch of leaves? Does the same batch of leaves always give tinctures with the same total solids, or are there variations in the extraction efficiency?" On this point very little information was available from commercial sources, and data had to be obtained from a series of small-scale experiments.

In spite of the care thus taken to standardise the conditions under which the tinctures were prepared, considerable variations were found in the total solids of tinctures prepared from the same batch of leaves. This might be as high as 20 per cent., or 11 per cent. from the average for any one leaf. On the whole, however, the variation was less than half this amount. The lowest total solids in any of these forty tinctures was 2.58, and the highest 4.16.

Variation in Potency of Digitalis Leaves

It was not possible to obtain samples of the leaves from which these abnormally weak tinctures were made, and to prepare tinctures from them under standardised laboratory conditions. In the absence of direct evidence, there may be some value in the indirect evidence obtained from the results of assaying digitalis leaves in this laboratory. During the same period in which the 100 commercial tinctures were examined twenty-four different samples of digitalis leaves were assayed by the cat method. Eighteen of these samples were British-grown and six foreign (including some Canadian). The British leaves were obtained from four different growers, at different times of the year, and may be considered a representative series. The results are summarised in a table.

Cultivation	No. of samples	Lowest	Highest	Average
British ..	18	89	156	120
Foreign (including Canadian)	6	63	122	98
Average of all samples ..	24	63	156	114

Comparison of Potency and Total Solids

In the above examples it will be noticed that when different tinctures were prepared from the same batch of leaves the variation in total extractive was not exactly parallel to the variation in potency. In both examples the percentage increase in the first was slightly smaller than the increase in the second. The question whether the total extractive can in any such conditions be employed to measure the variation in potency is of considerable importance to manufacturers. The author has previously described the possibility of tincture of digitalis deteriorating on storage, which renders it desirable that the tincture should not be used more than six months after it has been made. If only six months' supply of a tincture is to be made at a time, accurate biological assay of the small amounts of tincture made will add appreciably to the cost of the finished product.

In another table are summarised data obtained both on a small laboratory scale and on a manufacturing scale on four different batches of English digitalis leaves, all of which were grown on the same farm, and collected and dried with the greatest possible care. The potency of the leaves was determined by the cat method on infusions freshly prepared by the method recommended by the International Conference. The tinctures from leaves A, B and C were prepared by the manufacturers, and those carrying out the assays were not informed of the potency of the leaves from which they had been prepared. The tinctures from D were prepared on a laboratory scale. Even under these carefully controlled conditions considerable variations occurred in the amount of activity extracted by different tinctures from the same batch of leaves. Leaf A gave two tinctures assaying 89 and 111 per cent. respectively. The average of these is 100 per cent., and the deviation from this average is 11 per cent. Similarly the greatest deviation amongst tinctures made from Leaf B was 10 per cent., and for tinctures made from Leaf C the deviation was as high as 21 per cent. For Leaf D the deviation was only 3 per cent.; but these tinctures were made in the laboratory under carefully standardised conditions, to which a manufacturer could hardly be expected to conform. It was somewhat disconcerting to discover that when a tincture was prepared in India from a quantity of the leaf which had been sent out there this tincture had a potency of 200 per cent. when assayed on four cats. In order to decide whether the high temperature at which this tincture had been made had been the cause of the greatly increased potency, it was arranged to have two more tinctures made in India from the same batch of leaves. Samples of these tinctures when assayed in this laboratory (each on six cats) had practically the same potency. (These results are summarised in a table.) Thus it appears that the results of assays on leaves in this country may vary widely from the potency of tinctures prepared from these leaves in other parts of the world, a possibility which is most unwelcome to all concerned with the manufacture, administration, or testing of digitalis preparations.

SUMMARY

(1) Examination of 100 different commercial tinctures of digitalis showed that there was no definite relationship between the potency and the total solids.

(2) The total solids varied from 1.8 to 5.98 per cent. w/v; forty tinctures prepared in the laboratory from eleven different samples of leaf showed a much smaller variation in total solids (2.56 to 4.16), though the average for both series was the same (3.24). Similar or even greater differences were found in tinctures prepared on the manufacturing scale.

(3) The potency of the 100 commercial tinctures ranged from 49 to 200 per cent. of that of the standard tincture. Twenty-four different samples of digitalis leaf examined during the same period showed a smaller range of potency (63 to 156 per cent. of that of the international standard digitalis powder), but practically the same average potency as that of the 100 tinctures (114 as compared with 113 per cent.). The low potency of the two weakest tinctures was found to be due to inefficient percolation. If percolation is efficient no satisfactory sample of leaf should yield a tincture weaker than about 60 per cent., and English leaves will in most cases give tinctures more potent than the standard tincture.

(4) The same batch of leaves will not always yield tinctures of the same potency. Even when percolation is carried out efficiently, significant differences may occur (as high as 34 per cent. of the average). When percolation is less efficient, considerably greater differences may be found. The total solids of different tinctures prepared from the same batch of leaves are no guide to the variation in activity of these tinctures.

The author thanks Mr. H. Deane for much information regarding the cultivation of digitalis leaves and manufacture of tinctures on a large scale, and Mr. G. K. Elphick for assistance in the preparation and assay of many tinctures. (From the Pharmacological Laboratory, Pharmaceutical Society of Great Britain.)

DISCUSSION

Mr. BENNETT pointed out that it was seriously suggested a standardised leaf should be used and then no further testing would be necessary. This paper showed that such procedure would not be satisfactory.

Mr. GAMBLE remarked that physiological tests were not regarded as altogether satisfactory owing to the margin of error.

Mr. BULL asked as to the effect of seasonal variations.

Mr. BOYES referred to the relative alcoholic content of the tinctures, and inquired if moisture in the leaf influences potency.

Mr. RAE asked as to the effect of temperature on the leaf during storage.

Mr. HAYCOCK said that if preparations made in India showed greater potency, could not greater physiological activity be obtained if preparations were made with the aid of heat?

Mr. BREWIS asked if the author was satisfied that the leaves used in India and England were from the same sample.

Mr. FOURACRE inquired if there was any correlation between the fourth paragraph of the summary and the report issued by the Pharmacopœia Commission.

Mr. DAVIS inquired as to what are regarded as significant differences.

Mr. WALLIS asked if it was fair to look only at percolation, and pointed out that cats vary. (Laughter.)

Mr. BOYES said it had been shown that tests on frogs were preferable to those on cats, and in spite of the difficulties was it not desirable that in the case of so potent a drug the best-established methods be used?

Mr. WARE called attention to the fact that there is considerable variation even in plants growing in the same district.

Mr. WOKES, replying, said chemical tests would be welcomed if it could be shown that they could satisfactorily replace the physiological ones. As regards seasonal variation, the leaf used was obtained from one grower over a period of four years. From the data supplied it is evident that there is variation, but as regards this and the effects of sunshine and rain the author is as yet unable to reach definite conclusions. He did not think the moisture in the leaf seriously affected the results. The author had not tested the storage of the leaf at high temperatures. As to sampling, Mr. Wokes considered that when a large crop is collected it could be representative. Experimental error by biological tests might be from 6 to 25 per cent.; above the latter figure would be significant. Variations in animals do occur, but the data he had obtained from frogs confirmed their results with cats. He had no reason to suspect that the leaf used in India was different from that used in England.

The next paper taken was:—

Biological and Spectroscopic Tests on Ergot Alkaloids, with Notes on the Maurice Smith Colour Test

By FRANK WOKES, B.Sc., F.I.C., PH.C., and H. CROCKER, B.Sc.

[ABSTRACT]

IN this research an attempt is made to apply spectographic methods to the assay of ergot alkaloids. The suggestion that ergotoxine, ergotinine and ergotamine are isomeric is adopted, it being assumed that all three possess a molecular weight of 581. On this basis ergotamine and ergotoxine might be expected to have equal physiological activities, but the results of biological assay by Broom and Clark's method indicate that ergotamine has an activity which is between 80 and 90 per cent. of that of ergotoxine; it cannot, however, be claimed with certainty that this difference is beyond the limits of experimental error. Ergotinine and ergotaminine, usually classed as physiologically "inactive," are found to possess about one-tenth the activity of the "active" alkaloids (ergotoxine and ergotamine).

BRITISH PHARMACEUTICAL CONFERENCE ·1931·

The Maurice Smith colour test, when investigated spectroscopically, is found to be by no means a satisfactory method of evaluating ergot activity. The reagent consists of a 0.25-per-cent. solution of *p*-dimethylaminobenzaldehyde in concentrated sulphuric acid, and is applied by carefully adding to the solution of ergot alkaloid, avoiding overheating. Exposure to bright light is necessary for colour development, and the authors take tintometer readings at maximum intensity of colour. This procedure eliminates effects due to great variation in rate of colour development. Ergotinine and ergotaminine develop practically equal colour to the "active" alkaloids, although they possess only one-tenth of their physiological activity. Ergotoxine, ergotinine and ergotamine in aqueous and alcoholic solutions show a well-defined absorption band between approximate limits of $275\mu\mu$ and $360\mu\mu$ with maximum at $316\mu\mu$ to $322\mu\mu$ and minimum at $273\mu\mu$. Ergotinine and ergotaminine in alcoholic solution exhibit a small secondary band at $242\mu\mu$, but this inflexion is insufficient for quantitative differentiation. The blue colours of the Maurice Smith test show maximum absorption at $578\mu\mu$ to $582\mu\mu$. The absorption phenomena (apart from the small secondary band) of the ergot alkaloids and blue colours therefrom are possessed in common, and are probably due to some molecular grouping present in both "active" and "inactive" alkaloids. In the following tables the activities are calculated in terms of base and expressed as per cent. of ergotoxine ethanesulphonate (standard 100):—

—	Spectroscopic assay			Biological assay
	Ultra-violet absorption		Blue value (M. Smith test)	
	Aqueous solution	Alcoholic solution		
Ergotoxine ethanesulphonate	100	100	100	100
Ergotoxine base ..	89	91	—	—
Ergotinine base ..	105	89	73	11
Ergotamine base ..	89	103	90	89
Ergotamine "bitartrate"	99	101	101	80
Ergotaminine base ..	79	96	72	8

The above values show that there is no satisfactory agreement between biological activity and spectrographic assay. The spectroscopic method detects deterioration of ergot alkaloids during storage of solutions fairly accurately as regards ergotoxine ethanesulphonate, but fails entirely with ergotoxine phosphate. All solutions of ergot alkaloids are unstable and deteriorate upon storage, especially in contact with air at ordinary temperatures. It is concluded that the spectroscope cannot replace the biological method of assay.

The authors express their gratitude to Dr. R. A. Morton, of Liverpool University, for much advice and assistance with the spectroscopic work: to Dr. S. Smith, of the Wellcome Chemical Works, for supplies of pure recrystallised ergot alkaloids and for information regarding the results obtained by himself and his co-workers; to Mr. G. K. Elphick, Rammell Scholar, for carrying out a large number of the biological assays; and to Mr. Norman Evers for kindly confirming their colour test result on the deteriorated ergotoxine phosphate solution.

Discussion

The Chairman congratulated Mr. Wokes on his presentation of two difficult subjects, which had added a great deal to their knowledge. It was possible that in the next B.P. there would be a satisfactory liquid extract of ergot and one of the ergot alkaloids. Satisfactory ergot was difficult to obtain in the market.

Mr. Gamble asked whether the authors' paper brought the matter to date. He had heard of the possibility of a valid colour test.

Mr. Grier inquired regarding the origin of a commercial ergotamine not derived from ergot of rye.

Mr. Wokes, replying, said there was a possibility that extracts of ergot did not contain the inactive alkaloids, or that they contained them in a fairly constant proportion. Extracts prepared by the proposed new B.P. process contain ergotinine as well as ergotoxine. It was possible that a satisfactory colour test might be devised. The preparation of ergotamine from ergot grown on a grass had been described.

The Chairman pointed out that both the authors of the paper were present at the meeting, and thanked both on behalf of the Section.

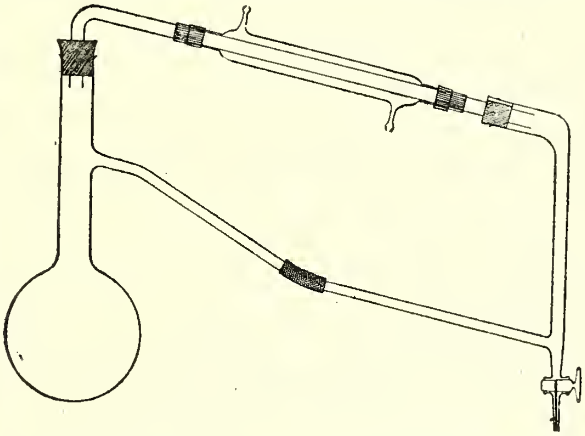
The next paper taken was:—

The Assay of Drugs Yielding Essential Oils

By G. R. A. Short, Ph.C.

[Abstract]

The special apparatus illustrated herewith has been devised as a means of overcoming the difficulties attached to the assay of drugs for their essential oil content. It consists of a one-litre distillation flask to which a water jacketed condenser is attached by its bent-down upper end. The lower end of the condenser is connected by a cork with a V-shaped vent to a receiver tube provided with a tap and side connection. The side tube of the receiver is united with that of the flask by means of a short rubber hose, and the completed connection serves as a "flow back" for the aqueous portion of the distillate. The method adopted consists of placing a sufficient quantity of bruised or coarsely powdered drug into the flask with 500 c.c. of water. A larger flask should be used for samples yielding less than 2 per cent. of oil, and 200 c.c. of water is sufficient when oil content exceeds 10 per cent. The receiving tube, after filling with water and 5 c.c. of petroleum ether, is connected to flask and condenser, and distillation continued for six hours with the flask immersed in a paraffin wax bath. Thereafter the contents of the receiving tube are run into a small separator and the tube rinsed with two successive portions of 5 c.c. of petroleum ether. The mixed distillate and rinsing are allowed to stand until separation of oily layer is complete. The aqueous layer is withdrawn and the petroleum ether extract transferred to a 90-millimetre filter-paper moistened with solvent. The filtrate and washings are collected in a 100-c.c. beaker flask. The petroleum ether is removed by immersing the flask in a water bath at 50° C. and passing a steady current of air over the liquid for five minutes. The essential oil is dried in a desiccator over sulphuric acid for one hour and weighed. The method gives results which are reasonably concordant and compare favourably with those of much larger-scale operations upon 3- or 5-kilogram samples.



In order to determine the quantity of volatile oil lost in the distillation owing to its solubility in the water used, and also the amount lost during the removal of the solvent, weighed amounts of oil of dill were distilled with the same amount of water that would be used in an actual experiment when using 100 grams of the fruits. The distillates from three such distillations were treated as described below. A similar quantity of the same oil was also treated, without distillation, with the usual amount (30 c.c.) of petroleum ether, which was subsequently removed on a water bath at 50° C. in a slow current of air which was maintained for five minutes. In each case the recovered oil was allowed to stand in a desiccator for one hour before weighing.

	Process	Loss of oil per cent.
(1) ..	2.635 grams of oil of dill and 500 c.c. water distilled in the apparatus, using petroleum ether as solvent..	12.10
(2) ..	2.655 grams of oil of dill and 500 c.c. water distilled without petroleum ether, but at conclusion of distillation 5 c.c. of ethyl ether introduced, by means of a pipette, into the receiving tube; the mixture of oil and ether drawn off and solvent removed on water bath at 40° C. in a slow current of air	9.60
(3) (*a*)	2.520 grams of oil of dill and 500 c.c. water distilled without the use of a solvent, the oil being allowed to separate in the receiving tube and then carefully drawn off and weighed.. ..	7.90
(3) (*b*)	2.920 grams of oil treated in same manner ..	7.20
(4) ..	2.975 grams of oil of dill dissolved in 30 c.c. of petroleum ether, the solvent being removed on water bath in the usual manner	4.90
(5) (*a*)	3.07 grams of oil of cloves treated as in (4) ..	0.98
(5) (*b*)	3.17 grams of oil of cloves treated in same manner	0.80

From the above figures it is evident that a result more nearly in accordance with the amount of oil actually contained in the drug is attainable without the use of a solvent. This modification of the method is only possible in the case of oils which are readily separable, and has been found to be impracticable with cloves, pimento, parsley fruits and myrrh.

SUMMARY

A method for the assay of drugs yielding essential oils, and a new type of apparatus for the purpose, is described. The method is fairly rapid and is quite simple in operation, while it is free from many of the disadvantages of processes previously described in the literature. The results were originally intended to give only an indication of the quality of the drug under test, but it has been found that in certain cases they are in fair agreement with those obtained by distillation of much larger quantities. It is considered advisable in the case of light oils, which are easily separable from the aqueous distillate, to dispense with the use of a solvent.

The authors' thanks are due to W. J. Bush & Co., Ltd., in whose laboratories the work was carried out.

DISCUSSION

The CHAIRMAN, in inviting discussion, described the author's apparatus as one of simple construction which could not fail to be useful in the assay of essential oils.

Mr. BREWIS remarked that all methods of small-scale distillation are subject to many losses—e.g., solution of the oil in the water. In evaporating the solvent one would probably lose some volatile oil. In the case of a sample taken by a food and drugs inspector it would be difficult to get a quantity big enough to work on, and he wondered what even approximate concordance three analysts would obtain. It needed 100 gm. of coriander to recover 0.1 gm. of coriander oil. The U.S. method for examining aromatic drugs was easy to carry out, but there was a difficulty with other bodies extracted at the same time as the volatile oil.

Mr. FOWLDS mentioned experiments he had carried out with cinnamon. Extraction with petroleum spirit was not satisfactory.

Mr. GRIER, after congratulating the younger members of the Conference on their interest in the science papers, remarked that he could not see how some of the author's results were obtained.

Mr. SHORT, in reply, said he preferred to use no solvent in the case of light oils. The difficulty of sampling for food and drugs analytical purposes was great, and the three analysts would have to use the same process. His own results were not quite comparable with those of large-scale working.

The CHAIRMAN expressed the thanks of the meeting.

In the absence of the authors the last five papers were read in abstract by Mr. C. E. Corfield, the first being on

The Hydroxy-Acid Complexes of Iron

By C. MORTON, B.SC., PH.C.

[ABSTRACT]

THE value pharmaceutically of the scale preparations of iron depends upon the fact that these hydroxy-complexes are less astringent than inorganic ferric salts and that they are non-precipitatable by weak alkalis. Their physical properties accord with the view that they are partly colloidal in character. Properties of scale preparations of iron exemplifying their colloid nature include:—(1) Colour and absorption spectra of solutions resemble those of concentrated ferric oxide sols. (2) Ill-defined and apparently almost unlimited solubility. (3) Prolonged dialysis produces a ferric oxide gel. (4) The readiness with which uncombined ferric hydroxide is peptised and protected. (5) Their amorphous nature. (6) The heterogenous character of the slimy precipitates, or rather emulsions, obtained by adding alcohol to solutions of scale preparations of iron. The ferri-acids or true anionic complexes exhibit striking differences. The author recently suggested that the iron in "iron and ammonium citrate" is present as a basic salt of the hydroxy-acid.

The present investigation provides results by means of glass electrode measurements which indicate that the formation of basic complexes with hydroxy-acids is of fairly general occurrence. The method depends upon determination of the amount of hydroxy-acid liberated when the salts of weak di- or tri- acid metallic bases with hydroxy-acids are hydrolysed by water in the presence of excess of acid anion. Neutral, soluble basic complexes are formed, the composition of which is deduced from the amount of acid liberated. Indicator methods of titration are impracticable owing to intense coloration of solutions of iron hydroxy-acid complexes, nor can hydrogen, quinhydrone, or antimony electrodes be employed. Upon titration of ferric chloride in the presence of excess of alkali-metal formate, acetate, succinate, phthalate, and tricarbyllate respectively, flocculation occurs in every case about PH 6.5. The neutralisation curves resemble those of ferric chloride alone (i.e., there is no evidence of complex formation). The behaviour of ferric iron in the presence of hydroxy acids forms a striking contrast.

Glycollic, lactic, mandelic, salicylic, malic, citric, tartaric and glyceric acids were selected as representative examples. As typical of the series a description is given of the neutralisation curve of a solution of ferric chloride in the presence of excess of sodium salicylate. The familiar deep violet precipitate of "ferric salicylate" is obtained upon mixing the ferric chloride and sodium salicylate solutions. Actually this is a mixture of basic salicylate of iron with free salicylic acid. The precipitate gradually dissolves, yielding a clear, deep violet solution with two equivalents of alkali to one gram-atom of iron. This corresponds to the first inflexion in the neutralisation curve, and it is inferred that the reaction is:—

$$FeCl_3 + C_6H_4OHCOONa + 2NaOH = Fe(OH)_2(C_6H_4OHCOO) + 3NaCl$$

The violet complex decomposes as addition of alkali proceeds, the solution changing to the reddish colour characteristic of basic iron hydrosols. A second inflexion appears with somewhat less than the theoretical quantity of alkali required for complete alkaline decomposition. The solution remains perfectly clear in the strongly alkaline region, but boiling or shaking with neutral salt solutions causes immediate and complete precipitation. The violet solution of the earlier stages yields a highly coloured diffusate, while slightly alkaline solutions give colourless dialysates containing little or no iron.

From these experiments it is inferred that a violet crystalloid complex is first formed in accordance with the above equation, and that this is decomposed to a red basic hydrosol by excess alkali. In ferric chloride-sodium salicylate- bicarbonate mixtures, the bicarbonate has the effect of buffering the clear red or violet solution to a Ph value between the two inflexion points in the neutralisation curve. The prevention of precipitation is usually attributed to the formation of "ferri-salicylic acid," but these investigations make it clear that the iron is present partly as basic hydrosol and partly as crystalloid complex, the proportions varying with degree of alkalinity attained. Inflexion points occur also in the neutralisation curves of "ferric citrate" and "ferric tartrate," and from their positions it is deduced that the deep reddish complexes have the formulas $Fe_2(OH)_3C_6H_5O_7$ and $Fe_2(OH)_4C_4H_4O_6$ respectively. The former is to be regarded as the active principle of "iron and ammonium citrate," and the latter the hydroxy-complex in "iron and ammonium tartrate" and "iron and potassium tartrate." The ferric citrate and tartrate compounds are more stable than the salicylate complex. Unstable complexes result with malic, glyceric, lactic and mandelic acids, the compositions of which are indeterminable since inflexions in their neutralisation curves are either ill-defined or absent. The hydroxy-acid complexes of iron are prone to hydrolysis, and more basic salts are yielded in solutions of low iron content. The complexes may be stabilised to some extent by adding excess of the alkali metal salt of the hydroxy-acid. The author concludes that in acid solutions the hydroxy-acid complexes of iron are present mainly as true electrolytes. In alkaline solutions decomposition occurs to varying extents with the formation of basic hydrosols, the apparent stability being due to the peptising and protecting properties of the hydroxy-acid ion.

There was no discussion.

The next paper taken was

Notes on Syrup of Senna and the Dispensing of Syrups in Wet Bottles

By Thomas McLachlan, A.C.G.F.C., F.I.C.

[Abstract]

(1) Syrup of Senna

The present Pharmacopœia gives such instructions for the manufacture of many products that, even by keeping strictly to the letter of the law, entirely different preparations may be obtained; standards for the finished article are omitted. Many of the present syrups are liable to ferment, and the public analyst is frequently in a difficult position when asked to state whether a sample is adulterated or not, since experience has shown that, as originally prepared or packed, the article might have complied with the requirements of the Pharmacopœia, but that, as sold, it certainly does not do so. For this reason syrup of senna has been chosen as a type rather than as a distinct preparation, and analyses have been made of seven commercial samples and the results tabulated:—

	S.g. 15°/15°C.	Total solids per cent.	Sucrose per cent.	Invert sugar per cent.	Senna extract per cent.
1	1.3015	68.0	52.7	3.0	12.3
2	1.3082	65.0	51.1	6.4	7.5
3	1.2995	63.8	53.4	5.7	4.7
4	1.2963	63.6	52.1	4.3	7.2
5	1.2910	61.6	54.4	2.1	5.1
6	1.2278	49.8	36.1	9.8	4.0
7	1.2828	59.0	0.4	44.2	14.4

Samples 6 and 7 were fermenting when bought, and were analysed in each case the day after purchase; two other samples were obtained, but they were so badly fermented that no useful purpose could be served by their inclusion. The alcoholic contents have not been determined. Sample 7 has been prepared from invert sugar, and is therefore adulterated; it is most improbable that it was made originally from cane sugar. Sample 6 is certainly not of the quality demanded, but it is possible that it was prepared originally according to the instructions of the Pharmacopœia. Far more important is the amount of senna extract present in the syrup, and it will be noticed that this varies from 4.0 to 14.4 per cent., or, in other words, a therapeutic dose of one product may be at least three and a half times that of another. This will be further affected by the method of heating the extract during the preparation, as it is now generally recognised that the purgative action of senna may be almost completely destroyed by oxidation when hot. In any case it is quite likely that several of these preparations do not comply strictly with the requirements of the Pharmacopœia, as it is a recognised custom in many houses to prepare all extracts by the use of methylated spirit, and after concentration to dilute with alcohol of the requisite strength. So far as the author is aware it is impossible to detect this procedure; it would be useful for a ruling on this point to be included in the next edition of the Pharmacopœia. Thanks are given to Mr. C. H. Cribb, B.Sc., F.I.C., and to Allen & Hanburys, Ltd.

(2) The Dispensing of Syrups in Wet Bottles

Several samples of syrups have been received recently in a fermenting state, although there was reason to believe that many of them had been prepared originally according to the instructions of the Pharmacopœia. One sample of simple syrup was in fact part of a delivery drawn from a stock of which the remainder was entirely satisfactory, so that the only conclusion which could be drawn was that it had been filled into a wet bottle. It is, moreover, the custom in some shops to rinse out bottles under the tap immediately before dispensing in order to make sure that they are clean, and it was thought advisable, therefore, to ascertain how much water might be left in a bottle by emptying it carelessly under the conditions prevailing when looking at and talking to the customer. The results are shown in a table. Several of the figures obtained show above 2 per cent. of added water, which is the limit for a safe addition to any syrup without rendering it liable to ferment, since the sugar is present as an antiseptic and not as a germicide. If small additions of water are made, both at the wholesaler's laboratory and at the retailer's shop, it is obvious that fermentation and adulteration will probably follow. This is particularly important when dispensing proprietary syrups, elixirs, etc., as these are prepared carefully with an extremely narrow margin between crystallisation and fermentation.

Discussion

Mr. Bennett said this was essentially a paper of pharmaceutical interest, especially as in the new Pharmacopœia it was proposed to include a liquid extract of senna pods and a syrup of senna made by the addition of syrup to the extract. In reply to a question by Mr. Grier, Mr. Bennett said he had not the Commission's report before him, but speaking from memory the extract was to be made from pods instead of leaves.

Mr. Rae spoke on the effect of temperature on the extractive.

The following papers by Mr. F. J. Todd, who is now in Capetown, were then read:—

Notes on Mercuric Nitrate Ointment and Liquor Eastoni 1-3 Pro Syrupo

By F. J. Todd, Ph.C.

[Abstract]

Mercuric Nitrate Ointment

The preparation of mercuric nitrate ointment presents several difficulties; the chief difficulties are as follows:—

(1) The monograph directs that the mercury (10 grams)

be dissolved in the nitric acid (30 c.c.) without the aid of the heat, but it does not state the steps to be taken to control the evolution of heat, which if allowed to proceed uncontrolled results in the copious evolution of brown fumes of nitric oxide and a rise in temperature to over 100° C. Experience has shown that the solution is best effected by surrounding the flask with a freezing mixture, so reducing the temperature that the reaction is brought about quietly with no evolution of fumes.

(2) It is difficult to raise and maintain the temperature of the lard and olive oil mixture at 150° C.

(3) Care is required in the addition of the mercurial solution, as it is quite easy for the reaction to get out of control

(4) The finished product does not keep well, tending to become granular and discolour.

As a result of a series of experiments it was found that a satisfactory preparation could be produced quickly and easily by the following method, and which after five months retained its colour and even consistency:—

Prepared lard	40 grams
Olive oil	70 grams
Heat to a temperature of about 90° C.	
Add mercury	10 grams
and nitric acid	30 millilitres
in small quantities at a time until the mercury is dissolved.	
Add solution of sodium hydroxide	25 per cent.
until the mixture is only faintly acid. Stir until cold.	

Using the above method the product is smooth, uniform and its keeping properties appear to be superior to those of the official ointment, while the consistency can be altered by varying the proportions of lard and olive oil.

Liquor Eastoni 1-3 pro Syrupo

In spite of the fact that syrup of phosphate of iron with quinine and strychnine is official in the present Pharmacopœia, it is not a satisfactory preparation, and the concentrated liquor either as a one-solution or two-solution preparation is much used for the extemporaneous preparation of the official syrup. The one-solution liquor would be the most useful form if it were not for the fact that it is very prone to deposit or even to turn into a solid mass at 60° F.

A consideration of the official monograph for the syrup indicates that a liquor which can be diluted one part with three parts of simple syrup should have the following composition:—

Iron wire	3.440
Phosphoric acid, sp. gr. 1.5	25.000
Strychnine	0.228
Quinine sulphate	5.920
Water to	100.000

or:—

Solution of ferrous phosphate B.P.C.	50.000
Strychnine	0.228
Quinine sulphate	5.920
Water to	100.000

In Series A of the experiments the amount of quinine sulphate was reduced from 5.9 per cent. by 0.5 per cent. in each case to 3.5 per cent., but in all cases the preparations were found to deposit. In Series B the amount of phosphoric acid was increased, the quinine sulphate remaining the same, viz., 5.9 per cent., but it was found that not until the amount of acid had been doubled did the preparation remain, but such an addition was not considered warranted. In Series C the amount of iron was decreased. (A table is given by the author.) The result of Series C indicates that the amount of iron present profoundly influences the stability of the liquor, and it is suggested that if the amount of iron were decreased from 3.44 per cent. to 1.37 per cent., using solution of ferrous phosphate B.P.C. from 50.0 per cent. v/v to 20.0 per cent. v/v, a stable single solution liquor could be produced. The work for this communication was carried out in the laboratories of Heynes Mathew, Ltd., Cape Town.

Solution of Bismuth and Ammonium Citrate

By F. J. Todd, Ph.C.

[Abstract]

Solution of bismuth and ammonium citrate has been official in the British Pharmacopœias of 1867, 1885, 1898 and in the present edition of 1914; in each the method of preparation being essentially the same, consisting of the formation of bismuth citrate which is subsequently dissolved in solution of ammonia. In this paper the present official monograph has been divided into stages and each discussed separately:—"Powder the citric acid (52 gm.) and mix it in a mortar with the bismuth oxynitrate (70 gm.) and 20 c.c. distilled water. Allow the mixture to stand with occasional stirring for half-an-hour or until a small portion is completely soluble in solution of ammonia." This stage of the manufacture has for its object the preparation of bismuth citrate. An examination of the costs of the various bismuth salts which might be used shows that the oxynitrate is the cheapest per unit content of bismuth. The amount of distilled water used at this stage is important, as it is a matter of common knowledge that if the quantity as at present prescribed be employed the result is a hard cement-like mass which cannot be easily broken up, and which renders the subsequent stages difficult. If, on the other hand, too large a quantity be taken the reaction is slowed up to such an extent as to be practically unworkable. If the quantity be increased to three and a half times, that is the same volume of distilled water (70 c.c.) be taken as weight of bismuth oxynitrate (70 gm.) the resulting magma is smooth, and further, the reaction can be speeded up by the application of heat.

"Transfer to a beaker, using 400 c.c. of distilled water to rinse the mortar, allow the precipitate to settle, remove the clear liquid by decantation, and wash the precipitate with three successive quantities, each of 400 c.c. of distilled water." As a result of a series of experiments it was found that the best results were obtained when the bismuth citrate, formed by the interaction of bismuth oxynitrate (70 gm.) and citric acid (52 gm.) and distilled water (70 c.c.) and heated in a water bath until soluble in solution of ammonia, was stirred up with boiling distilled water (1,000 c.c.), allowed to settle, decanted through calico, and the magma allowed to drain. By this method the bismuth citrate settled quickly as a crystalline precipitate, and although the magma contained free nitric acid the quantity was found to be fairly constant and in proportions not exceeding 0.1 per cent. w/v HNO_3 in the finished solution.

"Add to the washed precipitate while moist just sufficient solution of ammonia to dissolve it." It has been found in practice that following the above directions a variable quantity of ammonia can be added depending upon the amount of water retained by the precipitate and also on the rate of addition of the ammonia, the greater the dilution the slower the rate of solution of bismuth citrate with consequent risk of adding a very distinct excess, which has a profound influence upon the stability of the preparation. Adams showed that bismuth citrate can be titrated with solution of ammonia using litmus as an indicator, and adopting this to the preparation of solution of bismuth and ammonium citrate it was found to be a satisfactory procedure to add to the bismuth citrate magma, with a quantity of distilled water, the calculated amount of ammonia in the form of strong solution of ammonia and allow it to stand with occasional stirring until solution was effected.

"Add sufficient distilled water to produce 1,000 c.c. of the solution." It would appear reasonable that the preparation should be adjusted to a definite bismuth oxide content, and the wording of the monograph should be altered to allow of such an adjustment in the final volume.

AMMONIA CONTENT IN RELATION TO KEEPING PROPERTIES

From the results of a series of experiments it became evident that the amount of free ammonia present had a very important bearing upon the keeping properties, etc., and therefore it was decided to prepare samples with varying quantities of free ammonia and note their behaviour. It was, however, necessary to have some method whereby the free and combined ammonia could be estimated separately, and after trying several processes the following was decided upon as giving satisfactory results:—*Free Ammonia:*—To 20 c.c. of the solution add 25 gm. of sodium chloride and 200 c.c. of distilled water. Distil into $N/1$ sulphuric acid until the distillate is neutral to litmus. Titrate back with $N/1$ sodium hydroxide, calculate the result to per cent. w/v of NH_3. *Combined Ammonia:*—Cool the contents of the flask, add 150 c.c. of distilled water and 10 c.c. of a 25-per-cent. solution of sodium hydroxide. Distil into $N/1$ sulphuric acid as above and calculate the result to per cent. w/v of NH_3. Samples of solution of bismuth and ammonium citrate were then prepared, the amount of solution of ammonia added being the amount calculated to yield complete solution of the bismuth citrate and leave the product neutral or very faintly alkaline to litmus. (The author gives a table.) The free ammonia in one sample was estimated without the addition of sodium chloride and is included to show the necessity for the addition of this salt. To separate portions of another sample strong solution of ammonia was added equivalent to an increase in the ammonia content of 0.25 per cent. w/v NH_3 each, whilst to one portion 0.25 per cent. w/v citric acid was added; these were prepared in duplicate, stored in direct or diffused light, and their condition noted after a period of four months. (A table is given.)

From the experiments it was concluded that if solution of bismuth and ammonium citrate be acid, neutral, contains a quantity of ammonia less than 0.1 per cent. w/v or more than 0.5 per cent. w/v, the preparation is not stable and comparatively quickly deteriorates. It is suggested, therefore, that the amount of free ammonia be adjusted to about 0.25 per cent. w/v NH_3, which was shown to give a preparation which is stable. A revised monograph is suggested for solution of bismuth and ammonium citrate as follows:—

Bismuth oxynitrate	70.0 gm.
Citric acid	52.0 gm.
Strong solution of ammonia, Distilled water	Of each a sufficient quantity

Dissolve the citric acid in 70 c.c. of distilled water, add the bismuth oxynitrate. Heat the mixture in a water-bath with constant stirring until the magma thickens and then occasionally until a small portion is soluble in solution of ammonia. Add boiling distilled water 1,000 c.c., stir well, stand and strain through calico, allowing the magma to drain. Transfer to a vessel, add strong solution of ammonia 30.0 c.c., allow to stand with occasional stirring until solution is complete, add distilled water to produce 1,000 c.c. Filter, adding a small quantity of decolourising charcoal. Determine the proportion of bismuth oxide, adjust the volume by the addition of distilled water to a strength equivalent to 5.0 per cent. ± 0.1 w/v of bismuth oxide. Add 1 per cent. v/v of strong solution of ammonia.

SUMMARY

(1) The present official monograph for the preparation of solution of bismuth and ammonium citrate is discussed with reference to:—(*a*) The method of manipulation; (*b*) the initial amount of water to be used; (*c*) the solution of the bismuth citrate in ammonia. (2) It is shown that when the amount of free ammonia is about 0.25 per cent. w/v the preparation is stable, but that below 0.1 per cent. w/v and above 0.5 per cent. w/v and when acid it deteriorates rapidly. (3) A method is suggested for the estimation of the free and combined ammonia. (4) A revised method of preparation is suggested.

The author's thanks are due to Heynes Mathew, Ltd., Cape Town, for their permission to publish these results.

DISCUSSION

Mr. JONES said different behaviour in dispensing depends on the amount of ammonium citrate present, and he suggested a test for free ammonia.

Mr. HAYCOCK (Manchester) inquired as to what would happen in dispensing an alkaline solution with tincture of nux vomica.

The final paper was that dealing with

The Estimation of Moisture by Distillation

By G. MIDDLETON, B.Sc., A.I.C.

[ABSTRACT]

THE estimation of moisture—a simple and accurate estimation in the case of stable inorganic salts—is an operation which, in the case of many drugs, is much less simple than it at first appears. Though it is customary to regard the loss of weight at 100° C. as being equal to the moisture content, this is obviously untrue with drugs containing other volatile constituents, e.g., essential oils; and even when these are absent there is some uncertainty as to whether all the moisture is removed at 100° C. The loss on drying, therefore, though generally regarded as equal to the moisture content, is in reality a somewhat arbitrary value. In view of this uncertainty as to the absolute moisture content of materials, and with the special object of speeding up routine analysis, an increasing amount of attention has been devoted to the distillation method for the estimation of moisture. The principle of this method consists in boiling the sample with a volatile organic liquid which is immiscible with water, and condensing the vapour in a reflux condenser so arranged that the condensed liquid separates into two phases, the water being retained while the organic liquid is allowed to run back into the flask. The whole of the water is carried over as vapour with the vapour of the organic liquid used, and after the completion of the distillation the volume of water is measured. Heavy liquids are to be preferred because, being always halogen compounds, they are non-inflammable. Another advantage, in the case of drugs, is that the drug floats at the top of a heavy liquid, while with a light one it sinks to the bottom of the flask, where it may cake and become overheated.

In all forms of the apparatus previously described, with one exception, the vapour enters the lower end of a condenser which is open at the top, and the condensed liquid drops down from the condenser. With this design a small amount of moisture hangs on the inner surface of the condenser at the top of the column of vapour. It is obviously desirable that the flow of vapour and liquid should be continuous in direction, so that the water is carried along to the graduated tube, and there is no part of the apparatus which is not swept by the current of vapour or of liquid. A further advantage of this principle is that the condensed water is cold, so that its volume may be read off immediately after the distillation is stopped. One apparatus operating on this principle has been previously described. The one described in the present paper was constructed without knowledge of this previous design, and differs considerably from it. The apparatus is shown in detail and to scale in a figure appended to the paper. A special feature of the apparatus is the release valve, which allows of the release of excess pressure inside the apparatus while preventing free communication between the inside of the apparatus and the air. This valve should be ground in, but does not need to be absolutely airtight. The length of the water jacket of the condenser is designed to be no greater than is necessary to condense the vapour completely. For the estimation of moisture a suitable quantity (generally 10 gm.) of the material is placed in the flask with about 50 c.c. of tetrachlorethylene (carbon tetrachloride may also be used).

A little of the solvent is also run in from a pipette through the hole at the side of the valve, in order to fill the side tube and syphon. The flask is placed in a hole in a sheet of asbestos and boiled until all the water has collected in the graduated portion—about fifteen to twenty minutes being required. The flame is turned out and a little liquid run out through the tap in order to bring the water level to a point convenient for reading off. In doing this it is necessary to lift the valve, since there is a reduced pressure in the apparatus when it is cooling. After use the apparatus is rinsed out with alcohol and placed in the steam oven to dry. If the water tends to hang on the sides of the graduated tube and does not separate cleanly, the apparatus should be cleaned with chromic acid solution; this is required after about 10 to 12 estimations. The degree of reproducibility of the results obtained depends on the accuracy with which the volume of water can be read off. Since this may be read within about ±0.02 c.c., the variation in results obtained on the same sample should not be greater than 0.2 per cent., taking 10 gm. of material. It is from a practical point of view most important to standardise the conditions of the determination. This requirement is more easily complied with in the distillation method than by methods of drying. (From the laboratories of The British Drug Houses, Ltd.)

Discussion

Mr. Brewis regarded the apparatus as a great improvement on that in which the condenser is a reflux one, and he considered the use of carbon tetrachloride as superior to xylene. He would have great pleasure in using this apparatus.

Mr. Short said he did not like the release valve, as it seemed to complicate the apparatus and increase the risk of breakage. He also asked why the side tube projected through the walls.

Mr. Brewis showed an apparatus incorporating a wash bottle which was light enough to weigh on a balance and rendered it easy to obtain an aliquot part.

Mr. Bennett moved that the thanks of the Conference be accorded to the authors of the papers and all who had joined in the discussions, also to the editor of the "Quarterly Journal of Pharmacy" and the Council for providing the "Red Books." This proposition, carried with applause, ended the proceedings of the Science Section.

The Press of Manchester and the North noticed the opening of the Conference as an event of importance. "The Manchester Guardian" devoted more than half a column to the chairman's address, and upwards of a column to Tuesday's proceedings. The two evening papers of the city, in lighter vein, poked fun at the long words in some of the science papers. "The Yorkshire Post" had half a column on the opening session and the dinner, and "The Birmingham Post" gave these events a brief mention.

PRESENTATION AT THE CIVIC RECEPTION IN THE TOWN HALL ON MONDAY

Left to right; Mrs. Melhuish, Mr. Melhuish, the Lord Mayor of Manchester, Mr. E. H. Simmons, the Lady Mayoress, Councillor R. G. Edwards, Mrs. J. H. Franklin, Mr. J. H. Franklin.

BRITISH PHARMACEUTICAL CONFERENCE

The Social Side

THE reception given on Monday evening by the Lord Mayor and the Corporation of Manchester at the Town Hall was marked by a civic dignity to which the noble building contributed in full measure. The card of invitation specified the wearing of "full dress, academical robes or uniform"; and it was gratifying to notice that several pharmacists present and a few members of their families had donned the robes they were entitled to wear. Near the top of the grand staircase (which was bordered with plants in flower) the guests were received by the Lord Mayor and the Lady Mayoress, by whose side were the chairman of the Conference and Mrs. Franklin and the president of the Pharmaceutical Society and Mrs. Melhuish. In the Large Hall there was dancing to the strains of a capital orchestra. In the Council Chamber (which was crowded) a delightful entertainment went on simultaneously, comprising vocal music and the first-rate performances of an entertainer and a conjurer. Among the distinguished people present was Professor Raper, Dean of the Faculty of Medicine. With so brilliant a send-off, the success of the Conference was a foregone conclusion.

* * * *

The applause which greeted Mr. Franklin at the opening of the Conference had an unmistakable sincerity. No chairman (and no president) has ever been more widely popular in pharmacy, wholesale and retail; and his gallant fight against an irksome sense of fatigue has enhanced the esteem in which he has so long been held. Mr. Franklin's career is one of which any man may well be proud. He joined the staff of James Woolley, Sons & Co., Ltd., in 1880, and as soon as he was old enough commenced courses of study at the Manchester College of Pharmacy. After qualifying he proceeded to the "Major," attending Owens College and the Manchester School of Technology. He became a pharmaceutical chemist in 1890, and a little later was placed in charge of Messrs. Woolley's works and laboratories at Knowsley Street, Cheetham, whence has emanated a good deal of pharmaceutical research, as the General Index to the "Year-Book of Pharmacy" bears witness. In his younger days Mr. Franklin was fond of sport, and became an enthusiast in mounted infantry work. The older generation of Conference members will remember many occasions on which he delighted concert audiences with his cultured singing. Mr. Franklin was appointed a director of James Woolley, Sons & Co., Ltd., in 1907; in due course he became the senior managing director, and last year (*C. & D.*, 1930, II, 714) his fifty years' association with the company was marked by a presentation from his fellow-directors and the staff.

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On Tuesday afternoon two excursions were arranged, one party of ladies going to McVitie & Price, and the other to Cussons, Sons & Co., Ltd. Two motor 'buses conveyed a party of 50 to the works of McVitie & Price. The visitors were very interested in seeing the making of corrugated paper which is used in packing the biscuits, and printing presses involving letterpress and colour printing. The party was shown the general offices, which were greatly admired for their spic-and-span appearance, equipment and consideration for the staff. A bright and cheery atmosphere pervaded this and other departments. Next came the mixing of the dough, rolling out, stamping, etc., of the biscuits. In all these processes ingenious machinery plays so great a part that manipulation by hand is reduced to a minimum. Every visitor was presented with a souvenir of the visit in the form of a box of various biscuits. Following tea, provided in their spacious pavilion, Alderman Percy Knott (a member of the local executive) in a witty speech proposed a vote of thanks to the hosts for their kindness and generosity. This was seconded by Mr. John Cleworth and ably supported by Mrs. Edwards. Mr. Shaw, in replying, said how pleased he was to have had the honour of showing the members of the Conference through their works.

* * * *

The excursion to the Kersal Vale factory was one of the most interesting and entertaining ever undertaken by Conferencers. The factory is so well planned, well equipped, and well organised for the production of the Piesse & Lubin and Cussons toilet specialities that attention to the minute details of manufacture never flagged. Moreover, the trouble taken and the courtesy shown by Mr. Cussons himself, his son, Mr. Leslie Cussons, Mr. May, Mr. Gardner and other members of the staff enhanced the enjoyment. The factory has been described and illustrated so recently in the Special Issue that no more need be said on that point, but it is particularly noteworthy that in these times of alleged commercial depression the Cussons' factory is two or three weeks behind with orders, and the 450 employees have been working overtime. After a tour of the works the entire party of about 150 was entertained to tea at Mr. Cusson's beautiful house in Kersal. There a much-appreciated and entirely novel feature was the inspection of Mr. Cussons's collection of orchids and other rare plants. The various greenhouses were eagerly inspected, and much amusement was caused by the feeding of two chameleons, who obliged the company by an exhibition of licking up bluebottles from Mr. Cussons's fingers. After tea a vote of thanks to the host and hostess was enthusiastically passed on the proposal of Mr. Scholes, Mrs. Bennett seconding in a characteristically witty speech.

* * * *

The Conference banquet in the Midland Hotel on Tuesday evening was not only a successful function—that goes without saying—but also a function marked by the cordiality that is the sign of a gathering of friends. The chairman (Mr. J. H. Franklin) presided, and those at the top table included Mrs. Franklin, the Lady Mayoress of Manchester, Mrs. E. J. Woolley, Sir W. Davy, Professor H. S. Raper, Professor F. E. Tylecote, Professor Lapworth, Dr. R. Veitch Clark, Dr. Beutice, Dr. McDonald, the president of the Pharmaceutical Society of Great Britain and Mrs. Melhuish, the president of the Pharmaceutical Society of Ireland, the vice-president of the Pharmaceutical Society of Great Britain, Mr. S. J. Badger, Mr. Herbert Skinner, Mr. John Keall and Dr. F. W. Crossley Holland.

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The toasts were four in number, following an excellent dinner and alternating with a programme of first-rate music, contributed to by Miss Isobel Baillie, Mr. Norman Allin and Mr. Arthur Catterall (artists whose names are household words), with Mr. John Wills at the piano.

* * * *

The musical centre of England, as Sir Edward Elgar once remarked, is not London but "somewhere further north." The toast of "The Pharmaceutical Society of Great Britain" was submitted by Professor Raper in a speech delightfully balanced with wisdom on one side and humour on the other. The Pharmaceutical Society, Professor Raper said, had an extremely high reputation. The University's Department of Pharmacology and Materia Medica had received considerable support from the local branch. The Benger and the Woolley Laboratories were other instances of generous support. The standardisation of certain drugs at Bloomsbury Square was an enormous step forward. As to the Pharmacy and Poisons Bill, the public needed to be protected against the unqualified person.

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The president of the Society, responding, pointed out that Manchester University was the first university to institute a degree in pharmaceutics. The policy of the Society was that of its founders. Then came the toast of "The British Pharmaceutical Conference," proposed by another doctor, Professor Tylecote, also of the Victoria University, who vied with his distinguished colleague in telling really funny stories and sandwiching in them matter for thought. In Manchester, he said, there had always been the most friendly relations between doctors and chemists. He and others had been protected in early days from error by chemists, and doctors profited by those collaborations. Everyone in Manchester recognised the splendid work Mr. Franklin had done. Professor Tylecote ended with the suggestion, warmly applauded, that travelling scholarships and fellowships in pharmacy were desirable. Mr. Franklin, premising that he was not allowed to make a speech, expressed his gratitude for the reception of the toast, for the kindness shown to him during the Conference, and for the suggestion as to travelling scholarships. Pharmacy, he concluded by saying, held a responsible position in the State—a truth that should have wide publicity.

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Mr. F. Gladstone Hines, member of the Pharmaceutical Council, who was wearing a red rose in honour of his county's traditional enemy, proposed "The Lord Mayor and Corporation of Manchester." He proceeded in a witty speech to pay tribute to the industrial and other activities of the city. In the unavoidable absence of the Lord Mayor the response was made by Sir William Davy, who spoke in glowing terms of the numerous municipal undertakings and his faith in the future of the city. The toast of "The Guests" was given by Mr. E. H. Simmons, who expressed the appreciation of all who had partaken of the hospitality of Mr. and Mrs. Cussons during the afternoon. The response was made by Dr. R. Veitch Clark, medical officer of the city.

* * * *

In spite of gloomy forebodings the sun shone brilliantly for the ladies' motor tour in Cheshire on Wednesday morning. Full advantage was taken of this opportunity of seeing a stretch of characteristic Cheshire country, the route being by Wilmslow and Prestbury to Gawsworth church and vicarage, returning by Alderley Edge. A short halt was made at Prestbury, but not long enough to do justice to the fine old church and the ancient Norman chapel adjoining. At Gawsworth the Rector welcomed all and sundry, and took them over the vicarage (originally built about 1470), where the hall, open to the roof, is a special feature. The Old Hall was the Manor house of the Fytton family, and the Church is built on the site of a Norman chapel. The Rector explained the points of interest, such as the coats of arms on the lower walls, the gargoyles of unusual size and beauty, the corbels and the Sanctus bell cot—a unique example of turret and cross in combination. Two of the yew trees growing outside are mentioned in Domesday Book. In the interior the principal features are the gorgeous carved roof, the chancel (a marvel of timber work), the fifteenth-century font, and the monuments of the Fytton family.

* * * *

The Conference garden party, held on Wednesday by courtesy of the Manchester Corporation in the spacious park of Wythenshawe Hall, a few miles out of the city, was another triumph of Local Executive organisation. Tea was served in a marquee, and an excellent band was in attendance; in addition, there were the amenities of the exquisite Hall, with its timbered work and its profusion of old furniture, china and pictures. After tea, courteous guides delegated for the purpose by the civic authorities, conducted the visitors in parties through the well-kept gardens. The official Conference photograph was taken to the accompaniment of the usual merriment and after impatient calls for a very important personage whose coming was unaccountably delayed.

* * * *

The Conference Ball, held at the Midland Hotel on Wednesday evening, was a brilliant success. To the strains of a capital orchestra the dancers carried out their evolutions till the supper interval, when an adjournment to the first floor balcony was made. The thoughtfulness of the local executive in selecting this spacious resort for supper was much appreciated. Small tables enabled groups of friends to gossip in the intimate fashion preferred by pharmacists and many were the stories ancient and modern exchanged over the supper table. After that, "on with the dance" again till bedtime.

* * * *

Photo] [*Cleworth*

A GROUP OF SIGHTSEERS

Left to right: Messrs. Ridley (Carlisle), Trick (London), Weir (Aberdeen), Hay (Aberdeen), C. Simpson (ex-chairman of the North British Executive)

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The Conference luncheons at the Midland Hotel were by general consent the best that the oldest visitor could remember. Lancashire is famed for its nurture of the inner man, and everyone seemed thoroughly happy at these midday functions—though "functions" is perhaps too formal a word. The loyal toast and no speechmaking was the rule. On Wednesday Councillor Edwards read a brief and cordial letter from the veteran Dr. G. Claridge Druce, regretting his absence and sending good wishes to his old comrades in pharmacy.

* * * *

The perfection of the staff work of the Local Executive and its associated committees may be best indicated, perhaps, by the paradox that one did not know they were there. That is another way of saying that everything was ordered with long-prepared efficiency, so that every visitor had seats, tickets and other necessaries for every function. And all was done without bustle, as is the way of true hospitality. The choice of the palatial Midland Hotel, too, as headquarters, was amply justified by the result. The committees deserve the tributes that, as we write, are not yet paid—but will be.

BRITISH PHARMACEUTICAL CONFERENCE · 1931 ·

Who Were There

The following is the official list of members and visitors attending the Conference :—

Adams, Miss E., London
Allen, J. W., Wilmslow
Antcliffe, H. and Mrs., Sheffield
Armitage, N. and Mrs., Leeds
Arnfield, T. O., Stockport
Ashworth, W. A., Monton
Atkinson, J. W. and Mrs., Birmingham
Auger, Mrs. A., Manchester
Aves, J. W. and Mrs., Prestwich
Badger, Mrs., N. Ireland
Badger, Miss, N. Ireland
Barker, E., Levenshulme
Bates, F. W., Old Trafford
Bayles, H., London
Beard, E. and Mrs., Manchester
Beardsley, W. J. and Mrs., Essex
Beedle, L. E., Old Trafford
Bell, W. A., Southsea
Bennett, R. R. and Mrs., Harrow
Berry, H., Birmingham
Berry, E. and Mrs., Hyde
Blair, W. L. and Mrs., Bolton
Boldry, Mr., London
Bowden, Miss, Northwich
Boyes, G. R. and Mrs., London
Boyes, Miss L. M., London
Brackenbury, N. R., Middlesbrough
Brecknell, F., Stretford
Breese, J. S. and Mrs., Manchester
Breese, Miss K. M., Manchester
Breese, L. S., Manchester
Brewis, E. T., London
Brindle, H., and Mrs., Whalley Range
Browne, F., London
Browne, Mrs. E. Neville, Mitcham
Bryan, D. A., Penmaenmawr
Bull, B. A., Nottingham
Bullions, Mrs. H. and Miss M., Pelaw
Caine, J. C. and Mrs., Birkenhead
Carlton, Miss E. A., Dundee
Carns, Mrs. H., West Lothian
Carter, J. C. and Mrs., London
Chalmers, W. and Mrs., London
Chaloner, F., Preston
Clarke, Miss M. I., London
Cleworth, J. and Mrs., Whalley Range
Clubb, W. H., Liverpool
Coats, T. H., Whaley Bridge
Collier, L. and Mrs., London
Collins, J. A. and Mrs., Manchester
Cooke, C. W., Hoylake
Corfield, C. E., London
Coull, Dr. G., Leeds
Coutts, J., Glasgow
Cox, T. and Mrs., Pendleton
Culbert, W. S. and Mrs., Ainsdalo
Cuttiford, W. F. and Mrs., Manchester
Davis, H. and Mrs., Middlesex
Davison, J. Lyle and Mrs., Manchester
Dawson, Wm., Wigan
Deacon, W., Bridgwater
Desmond, D., London
Desmond, Mrs. V., London
Dick, A. A., Belshill
Dickson, D. and Mrs., Manchester
Dickson, R. D., Manchester
Dickson, Miss L. S., Manchester
Dixon, W. L., London
Dobie, Miss E., Birkenhead
Duff, P. M., Glasgow
Duncan, Prof. J., Manchester
Duncan, H. M., Aberdeen
Dunn, W. R., Bakewell
Dutton, Mr. and Mrs., Stockport
Eastwood, A., Bridlington
Eastwood, T. L., Bridlington
Eastwood, Prof. R. A. and Mrs., High Lane
Eden, W. J., Manchester
Edwards, R. G. and Mrs., Withington
Egerton, W. L., Portsmouth
Etherington, L. and Mrs., Rochdale
Evans, D. H., Liverpool
Evans, G. W., London
Fairhurst, Mr. and Mrs., Wigan
Farnworth, R., Bolton
Farquhar, J., Aberdeen
Fell, J., Liverpool
Ferrey, G. J. W., Cheadle Hulme
Fewster, C. L. and Mrs., Manchester
Finlay, V., Edinburgh
Fish, Miss D., Manchester
Fish, Miss M., Manchester
Flint, F. B. and Mrs., Timperley
Forster, W., Seaham Harbour
Forster, N. E., and Mrs., Northumberland
Foster, H. S., Surrey
Foulds, W. L., Manchester
Fouracre, R., London
Francis, Alan, London
Franklin, A. J. and Mrs., Brighton
Franklin, J. H. and Mrs., Manchester
Freeman, Miss A., Manchester
Freeman, Miss R., Prestwich
Freke, Mrs., London
Fyfe, Miss E., Dundee
Gamble, F. W. and Mrs., Harrow
Gaze, W. E., London
Gilbert, J. S. and Mrs., Swansea
Gillingham, H., Leeds
Gilmour, J. P., London
Goldthorpe, J. R. and Mrs., Wilmslow
Gower, J., Llanelly
Gray, F. P. J., London
Gray, W., London
Grier, J., Manchester
Griffiths, C. H., Cheltenham
Guthrie, T. and Mrs., Glasgow
Hallett, W. J. and Mrs., Bath
Hampshire, C. H., London
Hampson, J. R. and Mrs., Leigh (Lancs.)
Hardy, T. and Mrs., Maryport
Hardy, W. J., Belfast
Harris, A. E., Newcastle-on-Tyne
Harrison, A. W. and Mrs., London
Haselgrove, L., Manchester
Haworth, H. and Mrs., Swinton
Hay, W. F., Aberdeen
Hayes, Miss G. Dennis, London
Hill, C. A., London
Hill, J. Rutherford, Edinburgh
Hines, F. G., Felixstowe
Hogley, P. and Mrs., Manchester
Holland, F. W. Crossley, Dunstable
Hough, R., Manchester
Howard, D. Lloyd, Ilford
Howarth, G. W., Swinton
Humphreys Jones, H. and Mrs., Liverpool
Humphreys, G., Northwich
Inglis, F., Bramhall
Inglis, Miss K. M., Bramhall
Jackson, R. E., North Shields
James, E. B., Liverpool
Jenkin, A. H., London
Jenkins, Miss E., Dundee
Jones, A. J., Liverpool
Jones, J. Lee, Cardiff
Jones, S. Clifford, London
Jones, T. W., London
Joyce, C., and Miss S., Dublin
Keall, J. and Mrs. London
Kerfoot, E. H. and Mrs., Buxton
Kerfoot, H. N., Buxton
Kerfoot, T. H. N. and Mrs., Bramhall
Kidd, J. C., Manchester
Kirkby, W., Manchester
Kirkpatrick, D. L., Belfast
Knott, P. and Mrs., Bolton
Knott, W. W. and Mrs., Harrow
Lancaster, J. and Mrs., Leeds
Latham, F., Tyldesley
Leather, A. H. and Mrs., Manchester
Lescher, T. Edward, Liverpool
Lewis, D., and Miss M., Pendleton
Linstead, H. N., London
Lloyd, H. M., Merthyr Tydfil
Lockyer, J. C., London
Lynch, Miss C. K., Hastings
McCutcheon, W. J., and Mrs., Swinton
McDonald, A. and Mrs., London
Mackie, H. B. and Mrs., Brighton
McNeal, J. F. and Mrs., Bucks
McVitae, J. B., Glasgow
Mallinson, G. A., London
Marns, T., London
Maskell, R. B, and Mrs., Kersal
Maude, A. and Mrs., Manchester
Mawer, G. R. K., Wrexham
Meacham, E. R., Salford
Meadows, V. J., Salford
Melhuish, A. R. and Mrs., London
Merrin, A. C., London
Miller, T. and Mrs., Hale
Milner, J. and Mrs., Greenwich
Millner, R. and Mrs., Manchester
Morley, H. T. and Mrs., Heaton Norris
Mortimer, A. and Mrs., London
Muers, I. W., London
Mumford, H. A., London
Mumford, H. G. and Mrs., London
Mumford, Miss Cherry, London
Nidd, J. H., Manchester
Nisbet, P., Leith
Noble, C. A. and Mrs., Edgware
Nugent, Dennis J. and Miss Pat, Dublin
Nuttall, Miss, Disley
Oliver, J., Hull
Osborne, A. R., Slough
Parry, L. Moreton, Liverpool
Peck E. Saville, Cambridge
Phillips, F. D., Haverfordwest
Phillipson, W. E. and Mrs. Brackley
Pidd, Miss, Manchester
Pidd, Miss M. E., Manchester
Pidd, L., Manchester
Pidd, Mrs. A. E., Manchester
Piper, C. and Mrs., Sheffield
Piper, L. and Mrs., Ipswich
Plowright, J., Brighton
Pollock, Dr. and Mrs., Manchester
Poole, Mr. and Mrs., Birmingham
Poole, E., Cardiff
Prior, J. S., Stamford
Purdie, Miss J. A., Edinburgh
Purse, F., Leicester
Rae, A., Liverpool
Rae, J., Liverpool
Rankin, Irving G. and Mrs., London
Reed, J., London
Reynolds, C. E., Nottingham
Ridley, T. M., Carlisle
Roberts, Miss I., Manchester
Roberts, R. H., Manchester
Robinson, Miss H., Manchester
Robinson, Miss M., Manchester
Robinson, R., Cardiff
Ross, M. C. and Mrs., Aberdeen
Rowsell, P. F., Exmouth
Sargent, Miss E., Manchester
Scholes, W. I., Eccles
Shattock, Miss M., Lancaster
Shaw, H. C. and Mrs., Hanley
Shaw, Mrs., Manchester
Shore, G. R. A., London
Simmons, E. H. and Mrs., Manchester
Simmons, Dr. D., Manchester
Simmons, Miss M., Manchester
Simpson, C., Aberdeen
Sinclair, G., Peebles
Skinner, H., London
Sleath, E. W., Alderley Edge
Smiley, J. A. R. and Mrs., Pendleton
Smith, F. and Mrs. Birmingham
Smith, R. and Miss C. A., Stornoway
Sparshott, D. E., London
Sprott, Mrs. S. H., Manchester
Sprott, Miss M. F., Manchester
Stabler, E. and Mrs., Manchester
Stabler, S., Manchester
Stanier, W., Wolstanton
Storey, F. and Mrs., Belfast
Stout, H. and Mrs., Manchester
Sunter, R. and Mrs., Manchester
Swanston, W. E., London
Thomas, H. W., Glasgow
Thorpe, A. E. and Mrs., Manchester
Tocher, G. A., London
Todd, H., Belfast
Todd, J. P., Glasgow
Trick, W. B., New Barnet
Twigg, J. G. and Mrs., Withernsea
Twivey, A., Birmingham
Tyler, B., Redhill
Wallis, T. E., London
Walmsley, J. R. and Mrs., Wilmslow
Walters, E. and Mrs., Manchester
Ware, A. H., Plymouth
Waring, E. S., Nottingham
Watson, S. and Mrs., Hale
Weir, Mr., Aberdeen
Wells, F. G., London
White, G. S., Manchester
Williams, D. J. and Mrs., Bristol
Williamson, Miss, Manchester
Wilson, W. and Mrs., Bradford
Winch, Miss Hope C. M., Sunderland
Winchester, C. P., Eastham
Winstanly, T. H., Wigan
Wood, J. W., Manchester
Wood, L. G., Deganway
Woolley, Mrs. E. J., Manchester
Woolley, G. S., Manchester
Womersley, E., Urmston
Wyatt, W., and Mrs., Eccles
Young, J. C. and Mrs., London

Trade Report

Where possible scales of prices of chemicals are given for bulk down to small quantities. Prices recorded for crude drugs, essential and fixed oils and coal tar products are for fair sized wholesale quantities. Qualities of chemicals, drugs, essential and fixed oils, etc., vary, and selected brands or grades would be at higher values

28 Essex Street, W.C.2, July 23

The continuance of the European financial crisis has had the natural effect of imparting a feeling of acute lack of confidence on the part of all concerned with the markets, which has resulted in bringing business in many important products more or less to a standstill. Despite this handicap there is not the least tendency for the markets to weaken on quotation and the general tone is remarkably steady. The opinion is general that a solution of the present grave problem *must* be arrived at, and when that takes place a resumption, and possibly a fair revival, of business may follow. In pharmaceuticals there is little change to record and business has continued on the usual restricted lines. Tartaric and citric acids continue weak and further cuts in quoted figures are recorded this week. Cream of tartar is also a point lower on a poor market. Business in crude drugs has been sluggish and the markets are showing little real activity. The tone throughout is keeping particularly steady in face of the testing conditions of the moment. Ipecacuanha is, if anything, a point up on the week and the shipment market for cascara sagrada is a good deal dearer. Essential oils are, as a whole, keeping a very even keel, and beyond quite minor alterations there is little to report. Business has been affected by the financial difficulties of Germany and has been negligible, but would no doubt instantly revive with a satisfactory settlement at the London conference. Bourbon geranium is dearer for shipment. Japanese dementholised peppermint is steady and quiet. Business in fixed oils continues insignificant, the markets being quite neglected and no material improvement is looked for until the Seven-Power Conference has achieved its object. In the meantime quoted values are barely maintained. Industrial chemicals are mostly in small demand. Acetone, owing to acute competition, is easier, while oxalic acid is dearer. Coal-tar products are keeping steady, with quite a brisk demand for carbolic acid crystals.

Firmer	Easier	
Cascara sagrada	Acetone	Palm oil
Geranium oil	Ammonium benzoate	Rose oil
Ipecacuanha	Benzol	Rubber
Mandarin oil	Buchu	Sarsaparilla (grey)
Oxalic acid	Citric acid	Tartaric acid
Spearmint oil	Cotton oil	Turpentine
	Cream of tartar	

Pharmaceutical Chemicals, etc.

Conditions in this market show but little change during the week. The general tone is fairly steady and there is the usual flow of orders of limited size. Citric and tartaric acids are marked down this week and remain unsteady.

Acetanilid is about steady, while business is unimportant: B.P. crystals and powder, 1s. 4¾d. to 1s. 6d. per lb. as to quantity.

Amidol meets with a fair inquiry with the market steady: one cwt., 7s.; 56 lb., 7s. 3d.; 28 lb., 7s. 6d.; 14 lb., 7s. 9d. per lb. in 7-lb. tins.

Amidopyrin is steady as quoted, but there is not much business moving: crystals, five cwt., 11s. 11d.; two cwt., 12s. 1½d.; less than two cwt., 12s. 4d. per lb., with powder 1½d. per lb. extra.

Ammonium benzoate is cheaper at about 3s. per lb. and slightly less for large quantities.

Aspirin.—Business continues on a satisfactory scale and the market is steady as quoted: home trade, ten cwt., 2s. 7d.; five cwt., 2s. 8d.; one cwt., 2s. 8½d.; 28 lb., 2s. 9d.; 14 lb., 2s. 10d.; 7 lb., 3s.; 1 lb., 3s. 4d. per lb. Export to Colonies and British Possessions: ten cwt., 2s. 7d.; five cwt., 2s. 8d.; one cwt., 2s. 8½d. per lb. f.o.b.; less than one cwt., 2s. 9d. per lb., ex works.

Barbitone is seldom in demand; quoted prices unchanged: spot, one cwt., 7s. 3d.; smaller parcels, up to 7s. 9d. per lb.

Benzoic acid (B.P.) is moving in good quantities on a keen market: quantities, ex works, 1s. 9¾d.; spot parcels, 1s. 10d. to 1s. 10½d. per lb., ex store.

Benzonaphthol is steady on a slow market: spot, 2s. 8d. to 2s. 10d. per lb.

Bismuth salts.—There is no change in Convention prices: citrate, 8s. 7d.; subchloride, 10s. 5d.; carbonate, 7s. 9d.; subnitrate, 6s. 9d. per lb. in minimum cwt. lots; 3d. per lb. extra for smaller quantities.

Bromides.—Competition continues keen for business of any size, with quoted rates discounted; small orders of a few cwt. are done at about the prices mentioned: ammonium, 1s. 6¾d.; potassium, B.P. crystals, 1s. 3⅞d.; granular, 1s. 3¾d.; sodium, B.P., 1s. 5¾d. per lb.

Caffeine meets with occasional business: pure alkaloid, 7s. to 7s. 3d. per lb.; citrate, 5s. 4d. to 5s. 8d. per lb.

Calcium lactate is about unchanged with the market rather dull: spot, 1s. 1½d. to 1s. 3d. per lb. as to quantity.

Chloral hydrate, as quoted by home makers, is very steady; business fair: duty-paid crystals, 2s. 11½d. to 3s. 1½d. per lb. as to quantity and packing; foreign on spot, 3s. 3d. per lb.

Citric acid (B.P. crystals).—There seems to be no bottom to this market. The spot figure for foreign is now down to about 10¾d. and 11d. for small lots, less 5 per cent. discount, carriage paid, and the lower value would be shaded for any really big orders. The market continues unsteady. British makers quote 11d. per lb., less 5 per cent. discount, carriage paid.

Cream of tartar.—Business continues on a limited scale and mostly at cut prices: foreign is quoted on spot at about 87s. 6d. per cwt., less 2½ per cent., carriage paid, and this would be shaded for good-sized orders. British makers quote 80s. per cwt., less 2½ per cent. discount, carriage paid.

Creosote carbonate is slack: quoted on spot at about 5s. 6d. per lb.

Ephedrine hydrochloride is offered on spot at keen prices in the region of 8s. to 8s. 6d. per oz.; pure, 10s. 6d. to 11s. per oz. as to quantity.

Guaiacol carbonate remains dull: spot, 3s. 11d. to 4s. 1d. per lb. as to quantity.

Hexamine continues in limited demand, with competition keen for large orders: free-running crystals, spot, from 1s. 9¾d. to 1s. 10d. per lb., and less for large contracts.

Hydroquinone is steady as quoted and a fair seasonal business is being done: ten cwt., 3s. 3¾d.; five cwt., 3s. 4½d.; two cwt., 3s. 5¼d.; one cwt., 3s. 5¾d.; 56 lb., 3s. 6¾d.; 28 lb.; 3s. 8¾d.: 14 lb., 3s. 10½d.; 7 lb., 4s. 0½d.; 1 lb., 4s. 7d. per lb., carriage paid.

Lactic acid (B.P.).—Convention prices are unchanged without outside competition: one to 99 ks., 1s. 5d.; 100 to 499 ks., 1s. 4½d.; 500 to 999 ks., 1s. 4d.; 1,000 to 4,999 ks., 1s. 3½d.; and 5,000 ks. and over, 1s. 3d. per lb. in 50-ks. carboys, carriage paid.

Mercurials.—Makers' prices are keeping steady with the market rather quiet: red oxide, 6s. 10d.; corrosive sublimate, lump, 5s. 10d.; pulv., 5s. 3d.; white precipitate, 5s. 10d.; calomel, 6s. 3d.; yellow oxide, 6s. 9d.; persulphate, 6s. 1d. per lb. in minimum cwt. lots; 1d. per lb. extra for small parcels.

Methyl salicylate (B.P.) is a fairly bright market and the tone is steady: one ton and over, 1s. 3d.; five cwt., 1s. 3¼d.; one cwt., 1s. 3½d.; less than one cwt., 1s. 4d. per lb.

Methyl sulphonal is seldom inquired for, with values quoted unchanged: two cwt., 12s. 7d.; one cwt., 13s.; 56 lb., 13s. 5d.; small parcels, 13s. 7d. per lb.

Metol is steady, with business about average: 28 lb., 6s. 9d.; 14 lb., 7s. 3d.; 7 lb., 7s. 9d. per lb., and slightly less for larger quantities.

Milk sugar is being offered at very keen prices: one ton, 40s. 6d.; ten cwt., 41s. 6d.; two cwt., 43s. 6d. per cwt., in two-cwt. cases.

MORPHINE.—Makers' prices are maintained: pure alkaloid crystals, 24s. 8d.; precipitated, 24s. 5d.; hydrochloride powder, 19s. 9d.; crystals, 20s. per oz., with lower prices for quantities.

PARAFORMALDEHYDE is steady and a fair volume of business is reported: 100 per cent. powder, quantities in kegs, 1s. 4d.; smaller parcels, up to 1s. 5½d. per lb.

PARALDEHYDE is keeping steady and business has been a little better: quantities in demijohns, 10d.; drums, 11d.; winchesters, 1s. per lb.

PHENACETIN is about steady at Convention rates, although there is some outside competition: crystals, ten cwt., 3s. 8d.; five cwt., 3s. 9d.; two cwt., 3s. 9½d.; and less, 3s. 10½d. per lb., with powder 1½d. per lb. extra.

PHENAZONE is steady at the recently reduced rates and outside competition is not so severe: crystals, ten cwt., 6s. 4d.; five cwt., 6s. 5½d.; two cwt., 6s. 7d.; and less, 6s. 8½d. per lb., with powder 1½d. per lb. extra.

PHENOLPHTHALEIN is unchanged at controlled prices, but there appears to be very little business about: ten cwt., 5s.; two cwt., 5s. 1d.; less than two cwt., 5s. 2½d. per lb. Export, ten cwt., 4s.; two cwt., 4s. 1¼d.; less than two cwt., 4s. 2½d. per lb.

PHENYL ETHYL BARBITURIC is steady and in occasional request: less than 56 lb., 54s. 9d. per lb., carriage paid; bottles of one kilo and over, free; same prices for sodium.

PIPERAZINE has remained rather quiet, with prices about steady: one cwt., 26s. 10d.; 56 lb., 27s. 8½d.; 11 lb., 29s. 6d.; 2 lb., 30s. 4½d.; less, 31s. 3d. per lb. in 8-oz. bottles; one-oz. bottles, 31s. 7d. to 35s. 11d. per lb.

POTASSIUM PERMANGANATE (B.P.) is steady, but business remains limited to small orders: quantities in drums, 5¼d.; smaller parcels, 5¾d. per lb.

POTASSIUM SULPHOGUAIACOLATE is steady on a dull market: spot, 3s. 4d. to 3s. 6d. per lb. as to quantity.

PYROGALLIC ACID meets with a fair business, with controlled prices steady: one cwt., 6s. 9d.; 56 lb., 7s.; 28 lb., 7s. 3d.; 14 lb., 7s. 9d.; 7 lb., 8s. 6d. per lb., in 7-lb. tins.

RESORCIN meets with fair business and prices are well maintained: crystals, 2s. 9½d. to 2s. 11d. per lb. as to quantity, with powder 1d. extra.

SACCHARIN is unchanged: 1 lb., 43s. 6d. per lb., duty paid, with rebates for bulk quantities.

SALICYLIC ACID (B.P.) is firm at home makers' prices: one ton, 1s. 5d.; ten cwt., 1s. 5½d.; five cwt., 1s. 6d.; one cwt., 1s. 6½d.; small parcels, up to 2s. per lb.

SALOL has been rather quiet in demand; market steady: crystals, two cwt., 3s. 7½d.; one cwt., 3s. 9d.; 56 lb., 3s. 9½d.; smaller parcels, 3s. 10½d. per lb.; powder, 1½d. per lb. extra.

SANTONIN is being quoted rather keenly: 25 kilos, £48 10s.; 10 kilos, £49 10s.; one kilo, £51 10s. per kilo.

SODIUM BENZOATE (B.P.) continues in fair demand, with the market steady: one ton, 1s. 6½d. up to 1s. 7¼d. per lb. for small parcels.

SODIUM DIETHYLBARBITURATE is rather easier at 8s. 9d. to 9s. per lb. as to quantity.

SODIUM SALICYLATE (B.P.) continues steady and a very fair volume of business is being done, with home makers doing well: home trade, powder, two tons, 1s. 10d.; one ton, 1s. 10½d.; ten cwt., 1s. 11d.; five cwt., 1s. 11½d.; one cwt., 2s.; 28 lb., 2s. 1d.; 14 lb., 2s. 3d.; 7 lb., 2s. 4d.; 1 lb., 2s. 5d. per lb., with crystals 1d. per lb. extra.

SULPHONAL is quiet and some offers may be at slightly lower rates: crystals, 10s. 1d. to 11s. 2d. per lb. as to quantity, with powder 1½d. extra.

TARTARIC ACID (B.P. crystals).—This market is still unsteady and weak. Business has been only moderate. Foreign on spot has been done down to 10¼d. to 10½d. per lb., less 5 per cent., ex wharf, and it is possible even lower figures would be considered for large orders. British makers quote 11d. per lb., less 5 per cent. discount.

THYMOL.—The market is quite steady, but there is very little business moving: synthetic, fine white, one cwt., 6s.; 56 lb., 6s. 1d.; 28 lb., 6s. 3d.; 14 lb., 6s. 4½d. per lb.; ex ajowan seed, one cwt., 6s. 9d.; 56 lb., 6s. 10½d.; 28 lb., 7s.; 14 lb., 7s. 3d. per lb.

VANILLIN.—A moderate business is reported and most of the cheaper second-hand material has been cleared: ex guaiacol, one ton, 13s.: ten cwt., 13s. 3d.; five cwt., 13s. 6d.; three cwt., 13s. 9d.; one cwt., 14s.; 56 lb., 14s. 3d.; 28 lb., 14s. 6d.; 14 lb., 14s. 9d.; less, 15s. per lb.; ex clove oil, 14s. 6d. to 16s. 6d. per lb. as to quantity, from one ton to less than 14 lb.

Crude Drugs, etc.

AGAR-AGAR is very steady, although quiet on spot, with the shipment market again a point dearer: Kobe No. 1, 4s. 1½d. spot, 4s. 2d. c.i.f.; No. 2, 3s. 11d. spot, 3s. 11½d. c.i.f.; Yokohama, spot 3s. 11d., 3s. 10d. c.i.f.

ANTIMONY has been very quiet and is slightly easier on the week: Chinese crude, spot, £21; shipment, £14, c.i.f.; Chinese white oxide, spot, £30; shipment, £22 10s., c.i.f.

BALSAMS.—*Tolu* shows a further small appreciation, with spot at 2s. 6d. per lb.; Canada, 3s. 10d. per lb.

BELLADONNA is steady on a dull market, with good test root in the region of 44s. to 45s., spot.

BISMUTH.—The metal shows no further change at 6s. per lb.

BUCHU has been rather quiet: fair to good green rounds, 1s. to 1s. 1d.; ovals, 7½d. to 8½d. per lb.

CAMPHOR is about steady on a slow market: spot, slabs, 2s. 1d.; flowers, 2s. 1½d.; tablets, 2s. 6d. per lb.; shipment, slabs, 1s. 11d.; flowers, 1s. 11½d., and tablets, 2s. 4½d., c.i.f.

CARDAMOMS.—Bold Ceylon Mysore, 5s. 9d. to 6s.; mediums, 4s. to 4s. 3d.; small mediums, 2s. 9d. to 3s. 6d.; smalls, 2s. 3d. to 2s. 6d.; greens, 1s. 10d. spot; shipment 1s. 8d., c.i.f.; Bombay seeds, 3s. per lb. spot.

CASCARA SAGRADA.—The shipment quotation for car-load lots of new peel has advanced to 40s. to 41s., c.i.f. It is reported that the crop is well under average. 1930 peel is said to be limited on spot, quoted at 45s.

CASSIA FISTULA has been scarce on spot, with prices steady at from 28s. 6d.

CHAMOMILES.—Spot, old crop is quoted at about 110s. to 125s. for medium to fair white, with the market dull; new crop is quoted from 115s. to 120s., c.i.f.

CLOVES.—The market has been quiet all the week and is slightly easier: Zanzibar, spot, 9¾d.; August-October, 6⅞d., c.i.f.; Madagascar, spot, 8⅜d. sellers.

The landings of Zanzibar in London during the week ended July 18 were *nil* and the deliveries 3, leaving a stock of 439 against 958 in 1930. From January 1 to date, landings of Zanzibar have been 954 against 5,903 in 1930, and the deliveries 1,534, against 4,942 in 1930. Landings of Madagascar for the week ended July 18 were 28, and the deliveries 26, leaving a stock of 1,276, against 3,201 in 1930. Landings of Madagascar this year to date have been 2,113, against 4,824 in 1930, and the deliveries 1,743, against 1,636 in 1930.

COCONUT (DESICCATED) has remained dull and is again slightly easier: spot, fine and medium, 20s.; shipment, halves, August-September, 17s. 6d. sellers, c.i.f.

COD-LIVER OIL.—There has been a fair amount of inquiry and some contracts for autumn shipment have been placed. Exports of Lofoten medicinal oil to date total 42,000 hectol, leaving a balance of 17,000 hectol of this year's production. The shipment market is strong, with no inclination to accept bids, but rather to advance values as the buying season approaches. Finest non-freezing Lofoten oil, 113s. to 114s. per barrel, c.i.f.; spot, minimum five-barrel lots, 116s.; some grades may be slightly cheaper.

DIGITALIS LEAVES are unchanged on a slow market: Hungarian, ordinary, 38s. spot; shipment, 34s. c.i.f.

ERGOT is steady on a quiet market: Russian, spot, 10½d. per lb.; Spanish new crop is quoted at 1s. 3½d. to 1s. 4d. per lb., c.i.f.

GELATIN is unchanged on a flat market: gold leaf, 2s. 1d.; silver leaf, 1s. 8d.; bronze leaf, 1s. 5d. per lb., in cwt. cases.

GINGER is steadily maintained, although the market has been dull: West African, spot, 26s.; shipment, 24s., c.i.f.

GUM ACACIA.—The spot market has been dull and values have not been maintained, being about 1s. down all round. Spot, Kordofan cleaned, 39s.; natural, 37s.; bleached, 103s. to 105s.

HENNA LEAVES are unchanged on a dull market: spot, 25s. to 36s., as to colour.

HYDRASTIS continues in moderate call on a steady market: spot, 6s. 3d. to 6s. 6d. per lb.

IPECACUANHA is a very steady market and, recently, quite good business has been reported: Matto Grosso, on spot, is now at 6s. 6d. to 6s. 9d. per lb. The shipment market is also very steady.

JALAP is unchanged on quotation, but the market has been neglected: spot, good Vera Cruz, 13.6, 1s. 4d. per lb.

MALE FERN EXTRACT is quoted on spot at 3s. 5d. to 3s. 6d. per lb.

MENTHOL has been decidedly quiet, but the market is maintained fairly well: spot, K/S brands, 13s. 7½d.; July-August, 13s.; October-December, 13s., c.i.f.

Mercury is steady as quoted by Mercurio Europeo at £16 15s. per bottle, f.o.b.; spot, about £17 for fair quantities.

Papain has been in quieter demand, but the market is steady: Ceylcn good quality ground crumbs, 7s. 6d. per lb.

Pepper.—The spot market has been flat and quotations are slightly easier. The shipment market, however, is steady at rather dearer prices: Lampong, spot, $5\frac{1}{2}$d.; July-August, $5\frac{1}{4}$d.; August-October, $5\frac{1}{4}$d. sellers, c.i.f.; Tellicherry, spot, 6d.; August-September, 56s., c.i.f.; Aleppy, spot, 6d.; August-Setember, 55s. sellers, c.i.f.; white Muntok, spot, $8\frac{1}{4}$d.; July-August, $7\frac{9}{16}$d.; August-October, $7\frac{7}{16}$d., c.i.f.

Pimento has been very quiet on spot, with $3\frac{1}{4}$d. quoted. The shipment figure has been advanced to 29s. 6d., c.i.f.

Psyllium seed is rather dearer for new crop, with the shipment quotation up to 95s., c.i.f.

Rubber has been more or less neglected all the week and the market is a point casier. U.K. stocks, 136,463 tons, against 108,940 tons a year ago; No. 1 standard ribbed smoke sheet, sellers, spot, $3\frac{1}{16}$d.; July and August, $3\frac{1}{16}$d.; September, $3\frac{1}{8}$d.; October-December, $3\frac{3}{16}$d.

Saffron is about steady, but business has been unimportant: prime B.P., 42s. 6d.; extra B.P., 40s.; super B.P., 38s. per lb., spot.

Sarsaparilla shows no change and the market has been of little interest: genuine grey Jamaica, 1s. 1d. to 1s. 2d. per lb., spot.

Seeds (various).—Anise.—Spanish, 46s.; Bulgarian, 32s. 6d.; Russian, 30s. per cwt., spot. Canary.—Quiet and lower: Mazagan, spot, 18s.; shipment, 12s. 3d., c.i.f.; Tangier, 17s. 6d.; Kenitra, 15s. 6d. spot. Linseed.—Mazagan, 15s. 6d.; Morocco, 16s., spot. Coriander.—Firm at 9s. to 9s. 9d. for 1929 crop, sound condition. It is reported that Marseilles have been buying on this market. Cumin.—Malta, 50s., spot; shipment, 45s., c.i.f.; Moroceo, spot, 40s.; shipment, 32s. 6d., c.i.f. Fenugreek.—Prices are much lower: spot, 13s. 6d.; Tunisian is unchanged at 17s., spot. Caraway.—Dutch new crop, 25s.; prime old crop, 26s. 6d. Mustard.—English, 22s. to 32s. per cwt., according to quality.

Senega is a very steady item, with spot stocks in strong hands: quoted from 2s. 2d.; shipment, 1s. $9\frac{1}{2}$d. to 1s. 10d. per lb., c.i.f.

Shellac shows a recovery and tho market is now fairly steady: TN standard orange, spot, 75s.; fine orange, 87s. 6d. to 165s.; pure button, 92s. 6d.; for delivery, TN, August sold at 66s. 6d.; October sold at 68s.; for arrival, TN sellers, July-August, 64s., c.i.f.

Stramonium is about steady, but business is poor: Hungarian good green leaves, 41s. to 42s.; Italian, 32s. 6d., spot.

Tragacanth is unchanged and slow on spot, with medium to fine grades at £18 to £30 per ton. The shipment market is inclined to be slightly firmer.

Stocks on June 30 were 10,780 cwt. against 13,058 cwt. in 1930 and 11,868 in 1929. Landings to date 4,947 cwt.; deliveries, 5,202 cwt.

Wax (various).—These markets have remained generally quiet, but values are holding about steady: Japanese, on spot, 47s.; Carnauba, fatty grey and chalky grey, 67s. 6d.; medium yellow, 140s.; fine yellow, 170s. per cwt., spot. Candelilla is steady at 65s. per cwt.; Spermaceti, $9\frac{1}{2}$d. per lb., spot; Paraffin, 17s. 6d. to 27s. 6d. per cwt., as to melting point; Ceresine, 35s. to 80s. per cwt., as to colour and melting point; Bees, bleached, discs, £7; slabs, £6 17s. 6d.; yellow refined, £6 2s. 6d.; yellow crude, £5 5s. per cwt., spot.

Essential Oils

The steadiness of all the markets, despite the international financial crisis, is the feature of the week. Business has, of course, been rather trifling with everyone awaiting the result of the London Conference. In the meantime there are extremely few cheap sellers, and the shipment markets are well maintained, and in isolated cases are somewhat firmer. Sicilian oils are about steady; mandarin and Bourbon geranium are dearer. Japanese dementholised peppermint is quiet but holding at former rates.

Almond is holding on spot in the region of 6s. 6d. per lb., with occasional business.

Anise (star) has been mostly quiet, but the market is steady at unchanged prices: spot, "Red Ship," in leads, 2s. 2d.; in tins, 2s.; in drums, 1s. $10\frac{1}{2}$d.; shipment, in leads, 1s. $9\frac{3}{4}$d.; in tins, 1s. $8\frac{3}{4}$d., and in drums, 1s. $7\frac{3}{4}$d. per lb., c.i.f.

Bergamot.—The shipment market is still indefinite, with negotiations for control being carried on. The forward quotation is more or less nominal at from 7s. 9d. per lb. c.i.f., with spot values barely holding at last week's figure, being now about 8s. 3d. to 8s. 6d. per lb. Business appears to have been light, but the undertone continues on the firm side

Bois de rose is unchanged, with the market quiet: Cayenne on spot, 3s. 6d. per lb.; Brazilian, spot, 2s. 9d.; shipment, 2s. 6d. per lb., c.i.f.

Caraway is a quiet market, with quotations for Dutch double-distilled at 6s., spot; crude, 5s. 7d. per lb.

Cassia is about steady, but there is not much business about: oil passing the B.P., 3s. 3d. per lb., spot; shipment, about 3s. 1d., c.i.f.

Cedarwood has been in some demand, with spot about 1s. 7d., and shipment at 1s. 3d. to 1s. 4d., c.i.f.

Cinnamon leaf is about steady, with the market quiet: spot, 3s. 6d.; shipment, 2s. 9d., c.i.f.

Citronella.—This market has been quiet, but the recently improved tone is holding up fairly well: Java, on spot, 2s. 3d.; shipment, 2s. 1d., c.i.f.; Ceylon, spot, 1s. 9d.; shipment, 1s. 5d., c.i.f.

Clove is quoted on spot at about 5s. 9d. to 6s. 3d. per lb. as to quantity for 90 to 92 per cent.

Eucalyptus.—There are occasional cheap offers coming on the market, but spot values are about unchanged; business has been limited: 70 to 75 per cent., 1s. 1d. to 1s. $1\frac{1}{2}$d.; 80 to 85 per cent., 1s. 3d. to 1s. $3\frac{1}{2}$d. per lb., spot.

Geranium.—The shipment market for Bourbon is dearer and firm at 16s., c.i.f. The spot market has been very quiet and is more or less nominal at 16s. 6d. per lb.

Gingergrass is steady on a quiet market, with spot about 7s. 3d. to 7s. 6d. per lb.

Juniper berry (B.P.) is unchanged and in quiet demand: spot, 4s. 6d. per lb.

Lavender has been slow all the week but there is no change in quotations: French, 38 to 40 per cent., 8s. 3d. to 8s. 6d.; shipment, 8s., c.i.f.; 36 to 38 per cent., 8s. to 8s. 3d. per lb.

Lemon.—Business has been disappointing this week, but this has not materially affected the tone of the market, which continues fairly firm. Sicilian hand-pressed is about 3s. 9d. per lb. on spot, with the shipment figure from 3s. 6d. upwards, subject to acceptance. Machine-made on spot is about 3s. 5d. to 3s. 6d.; for shipment, 3s. 3d. per lb., c.i.f.; American oil, 2s., spot, in drums.

Lemongrass is holding at former rates, spot holders being unwilling to accept less: spot, 2s.; shipment, 1s. 9d., c.i.f.

Lime is steady on a short market: genuine distilled, 40s.; hand-pressed, 50s. per lb.

Mandarin is dearer, with the shipment figure fully 13s. and spot about 14s. 3d. per lb.

Orange is not quite so firm as last week, but the undertone is maintained and there is no material alteration in quoted values; business has been small: Sicilian, sweet, 7s. 3d. spot, and for shipment 6s. 9d. to 7s. per lb. American oil, spot, 3s. 5d. to 3s. 9d., as to quantity.

Palmarosa is steady at last week's improved figure of 8s. 6d. spot and shipment 8s. per lb., c.i.f.

Peppermint.—The market for Japanese dementholised is fully steady, although business has been restricted: on spot, 4s. $7\frac{1}{2}$d.; shipment, July-August, 4s. $4\frac{1}{2}$d.; October-December, 4s. 3d., c.i.f. American oil is in small supply on spot and is at about 9s. The shipment market is still nominal at about the same figure, with practically no offers coming to hand.

Petitgrain is unchanged, with the market dull: spot, 5s.; shipment, 4s. 3d. per lb., c.i.f.

Rose.—There are cheap offers on the market, which is rather easier: own distillation, about 50s.; green seal, 36s. per oz.

Sassafras has been very quiet: spot, 4s. 3d. to 4s. 9d. per lb., as to origin.

Spearmint is dearer this week, with spot at 10s. per lb.

Bay, spot, 5s. 9d. to 7s. 6d., as to phenol content; Cananga, 7s. 9d.; Ginger, 25s.; Neroli, French, 16s. to 22s.; Italian, 4s. 3d. to 4s. 6d.; Nutmeg, B.P., 5s. 9d.; Pennyroyal, dearer at 4s. 3d.; Sage, 1s. 10d. to 2s.; Thyme, white, 3s.; red, 3s. 6d.; wintergreen, 6s. 6d.; Wormseed, 12s.; Ylang-ylang, Manilla, 5s. oz.; Bourbon, 20s. to 32s. 6d. per lb.

The following quotations are current for synthetics:—acetophone, 6s. 3d. to 6s. 6d.; amyl salicylate, cwt. lots, 2s. 2d.; aubepine, ex para cresol, 6s. $4\frac{1}{2}$d. to 6s. 8d.; benzyl acetate, 1s. 5d. to 1s. 8d.; coumarin, 5 cwt., 10s.; one cwt., 10s. 6d.; small lots, 11s.; citral, 6s. 3d. to 6s. 4d.; ethyl phthalate, cwt. lots, 2s. 2d.; heliotropin, cwt. lots, 4s. 10d.; methyl anthranilate, cwt. lots, 5s. 6d.; musk ketone, 29s. 10d., with bonus for quantities; safrol, 1s. 10½d. to 2s.; terpineol, 1s. 1½d. to 1s. 6d.; all per lb., spot.

The following arrivals have taken place from the countries indicated during the period July 8 to 14, inclusive:—Anise (Star), (Gy.) 1 cs., (China) 16 cs; bay (B.W.I.) 3 cs.; bergamot (It.) 4 cs.; bitter almond (Fr.) 5 cs.; cassia (Jp.) 10 cs.; eucalyptus (Austl.) 60 cs.; geranium (Algeria) 3 dms.: lemon (Gy.) 3 cs., (Blgm.) 12 cs., (It.) 81 cs.; lemongrass (Ind.) 3 dms.; marjoram (Spn.) 1 cs.; orange (It.) 3 cs. (U.S.) 1 cs.; peppermint (U.S.) 2 dms.; valerian (Nthlands.) 1 cs.; various (U.S.) 5 cs., (Fr.) 1 cs., (Spn.) 1 dm.

The following arrivals have taken place from the countries indicated during the period July 15 to 21: Anise (Star) (Hong-K.) 72 pkgs.; bergamot (It.) 10 cs.; cassia (Hong-K.) 30 cs.; lemon (It.) 61 cs.; lemongrass (Ind.) 2 dms.; patchouli (Nthlands) 2 jugs; rose (Fr.) 1 cs.; sage (It.) 2 cs.; spearmint (U.S.) 7 cs.; various (Fr.) 9 cs., (Nthlands) 2 cs., (It.) 20 cs.

Fixed Oils, etc.

Business in these products has been unimportant and the markets in most instances have been stagnant. The suspension of business is due to the international financial crisis, and when this is settled a revival will no doubt take place. Acid oils have been slack and are slightly easier: coconut and/or palm kernel, 20s. 6d.; groundnut, 16s.; soya, 13s. 6d., spot. Castor is steady, but business has remained quiet: pharmaceutical, 39s. 6d.; first pressings, 35s. 6d.; second pressings, 32s. 6d. (barrels); cases, £4 per ton extra, ex mill, Hull, in not less than one-ton lots; Madras, 29s. 6d. (barrels), c.i.f.; Bombay, 29s. 6d. (drums), c.i.f. Coconut is steadier, with some business moving: deodorised, 31s. (barrels), spot; Ceylon, 21s. (drums), c.i.f. Cotton is easier and the market has been dull, closing unsteady: deodorised, 27s. 6d.; common edible, 25s. 6d.; soapmaking, 24s. 3d.; crude, 22s. (barrels), spot. Groundnut is unchanged on a slow market: deodorised, 29s. 3d. (barrels), spot; crude Oriental, 25s. 9d. (drums), c.i.f. Linseed (raw, naked) has been dull all the week, closing slightly easier: on spot, 17s.; August, 16s. 9d.; September-December, 17s.; January-April, 17s. 9d. Boiled oil, 19s. 6d., spot. Olive is fairly steady, but business is rather slow: edible, 4s. 10d.; B.P., 3s. 11d. per gallon, in 40-gallon barrels. Palm.—A further loss in values is recorded this week, with the market unsettled: Lagos, 17s.; softs, 16s. 9d.; mediums, 18s.; hards, 18s.; bleached, 20s., spot. Palm kernel is dull and unsteady: deodorised, 25s. 6d.; crude, 23s. 3d., spot. Rape is slightly cheaper on a dull market: refined, 30s. 6d.; crude, 29s. 3d., spot. Resin is about unchanged on the week, with the market dull: B, 10s. 9d.; D, 11s. 6d.; F/G, 11s. 9d.; N, 15s. 6d.; W/G, 18s.; W/W, 21s., ex wharf. Turpentine has been very flat this week and the market is easier: on spot, 47s.; September-December, 39s. 6d. Total London stocks, 17,436 barrels. Wood.—Hankow in barrels on spot is dull: quoted at 37s. 3d.

Industrial Chemicals, etc.

Rather sluggish markets are reported, but the tone continues generally steady. Acetone is cheaper on a very competitive market. Oxalic acid is firmer. Acetic acid meets with fair business at keen prices: 80 per cent., technical, £36 5s.; 80 per cent., pure, £37 5s. per ton, in barrels; glacial, pharmaceutical, 99 to 100 per cent., £58; in glass demijohns; glacial, in barrels, £47 per ton, carriage paid in U.K. Acetone, B.G.S., is cheaper owing to severe competition: £58 to £60 per ton, in drums, carriage paid in U.K., less for large quantities. Ammonia (anhydrous) continues in good demand: quoted at 9d. to 1s. per lb. for 99.95 per cent. material, in loaned drums, carriage paid, and less for important contracts. Ammonium chloride is steady but very quiet: grey galvanising, £21 7s. 6d. per ton, in casks, ex store; slightly less for contracts. Arsenic has remained in quiet demand: Cornish white powdered, £20 10s. nominal, f.o.r. mines; Mexican, £16 15s.; Continental, £16 15s.; Australian, £16 12s. 6d. per ton, c.i.f. U.K. Bleaching powder is unchanged at home makers' prices: 35 to 37 per cent., chlorine, £7 per ton, in four-ton lots, carriage paid. Formaldehyde is in fair demand at keen prices: 40 per cent., by volume, £26 to £26 10s. per ton, in casks, ex store; slightly lower prices for big quantities. Isopropyl alcohol is steady and business is fairly good: first quality, ex acetone, 10s. to 10s. 6d. per gallon, in drums, carriage paid; ex "cracked petroleum" qualities, 6s. 6d. to 8s. 6d. per gallon. Lead acetate has been dull for some time: brown, £31 2s. 6d.; white, £32 2s. 6d. per ton, in casks, ex store. Lithopone is steady but quiet: 30 per cent. Continental red seal, £18 10s. per ton, ex store; forward, £18 18s. per ton, c.i.f., less rebate of £2 per ton. Oxalic acid is dearer with quantities at £34 10s. per ton, and small lots 35s. to 35s. 6d. per cwt. Potash caustic, 88 to 92 per cent., solid, continues steady but rather slow; contracts for five tons, £25 2s. 6d. per ton, in drums, c.i.f.; spot, under one ton, £28 5s.; one to five tons, £27 5s.; five tons and over, £26 5s. per ton, in drums, ex store. Potassium carbonate is quiet: 90 to 92 per cent., £22 12s. 6d. per ton; 96 to 98 per cent., £25 per ton, in casks, ex store; lower prices for contracts. Potassium chlorate remains dull but prices are maintained: quantities, minimum one ton, £27 10s. per ton; small quantities, 3½d. per lb., ex store. Potassium permanganate is slack: commercial quality, in two-cwt. drums, 4¾d. per lb., ex store. Potassium prussiate is steady with occasional small business: yellow, in quantities, £63 10s. to £65 10s. per ton; single casks, 7d.; small parcels, 7½d. per lb., ex store. Sal ammoniac is steady but quiet: dog-tooth crystals, £32; medium, £28; fine white crystals, £17 2s. 6d. per ton, in casks, ex store; slightly less for contracts. Saltcake is firm on short supply: 57s. 6d. per ton, in minimum truck lots, in bulk, carriage paid. Sodium acetate is slack and irregular: £17 to £18 per ton in casks, ex store. Soda crystals (carbonate) is unchanged at makers' prices: £5 5s. per ton, in bags, f.o.r. works. Sodium bicarbonate is steady at makers' price; refined, in bags, £10 10s. per ton, carriage paid. Sodium chlorate is very slack: quantities, £26 5s. per ton; small parcels, from 3d. per lb., ex store. Sodium hyposulphite is easy as quoted: business fair; dealers quote pea crystals, in one-cwt. kegs, £15 per ton; commercial quality, £9 2s. 6d. in casks, ex store; makers' price for pure crystals to home consumers on contract, £15 per ton, carriage paid to buyer's works. Sodium prussiate is still rather dull: quantities, 4¾d. to 5d. per lb.; smaller parcels, up to 5½d. per lb., ex store. Zinc oxide is quiet and easy as quoted: white seal, £35 per ton.

Coal Tar Products, etc.

A moderate volume of business continues in this market with quoted values unchanged and the tone steady. Carbolic acid crystals have been in very good demand. Benzol continues in fair demand, market easier: standard motor 90's, 1s. 2d. to 1s. 3d. per gallon, in tank wagons, ex works; pure, 1s. 5d. per gallon. Carbolic acid crystals (39 deg. to 40 deg. C.).—This market is steady and unchanged with quite a good business moving; 100 tons, 5d.; 50 tons, 5⅛d.; 20-25 tons, 5¼d.; 10 tons, 5⅜d.; five tons, 5½d.; two tons, 5¾d.; one ton, 5⅞d.; 10 cwt., 6d.; smaller lots, 6¼d. to 6½d. per lb. in drums with over-casks, carriage paid or f.o.b.; crude carbolic 60's, 1s. 2d to 1s. 3d. per gallon, naked at works. Creosote oil is moving in moderate quantities at about 4d. to 5d. per gallon, as to quantity and district. Cresylic acid is about steady, but the demand has been restricted; pale, 98 to 100 per cent., 1s. 6d. to 1s. 7d.; dark, 95 per cent., 1s. 5d., special qualities, 2s. 1d. to 2s. 2d. per gallon ex works; American duty-free acid, 1s. 6d. to 1s. 7d. per gallon, f.o.b. Kerosene is unchanged and quiet; water white, 11½d.; standard white, 10½d. per gallon, in barrels, ex wharf, London; in bulk, 3d. per gallon less. Motor spirit is fairly active and steady; No. 1, 1s. 2½d.; No. 3, 1s. 0½d. per gallon, for U.K., except North Scotland, which is 1d. more, delivered in bulk; two-gallon tins, 1½d. per gallon more, except in inner London zone, 1d. extra. Naphthalene remains dull and rather unsteady; flakes, £11; balls, £11 per ton, in casks; ex wharf or works. Pitch is meeting with inquiry for next season; 45s. to 47s. 6d. per ton, f.o.b. East Coast. Pyridene remains rather dull; 90 to 160, 3s. 1d. to 3s. 3d. per gallon. Solvent naphthas have been on the quiet side; prices unchanged; 90 to 160, 1s. 3d.; heavy, 90 to 160, 1s. 1½d. per gallon naked at works. Toluol is about steady; demand limited; commercial 90's, 1s. 8d. to 1s. 9d.; pure, 1s. 11d. per gallon, ex works. Xylol is very quiet; commercial, 1s. 8d. to 1s. 9d.; pure, 1s. 11d. per gallon, ex works.

Herb Crop Reports

Hollands Distillery (Essential Oils), Ltd., report their Peppermint crops are not up to average, the plants being short in growth, but recent rains should improve matters, but the amount of oil produced is likely to be less than last season. When harvesting commences, the crucial point will be reached when an agreement must be concluded amongst all growers and distillers to fix a price round about 45s. per lb. Based on pre-war figures, and the extra cost of labour and other charges, it is difficult to see how peppermint oil can be produced lower than 45s. per lb. to pay.

London Drug Auctions

Commercial Sale Rooms,
Mincing Lane, E.C3
July 23.

There was little demand at the drug auction to-day and there is likely to be no improvement privately until a satisfactory solution of the European financial crisis has been reached. During the present week unseasonable weather for the period of year has somewhat interfered with the usual "summer" trade. About the only feature was a decline of 2d. per lb. in genuine grey Jamaica sarsaparilla and a slight all-round decline in buchu, partly due to forced sales. Good medium washed calumba sold cheaply without reserve. All the staple drugs were flat and prices generally were in buyers' favour. Honey was well represented, new crops being prominent, and although brokers were given a wide discretion, buyers only nibbled. There was no demand for cardamoms, but the sales are now mostly on private terms. Rhubarb was firmly held, with small sales at steady prices, and for beeswax fair average qualities of East African, etc., were obtainable at a practically all-round price of £5 per cwt.

Aloes.—Of Cape only five cases offered and bought in at 38s. per cwt. for ordinary part coarse seconds. Of Curaçao, 70 cases offered and retired at from 90s. to 110s. per cwt. for common mixed capey to ordinary part soft dull livery; three cases Zanzibar in skins were limited at 65s.

Annatto seed.—A lot of 21 cases good East Indian offered and retired at 6½d. per lb.

Areca.—A lot of 27 bags part wormy Ceylon was offered and bought in at 24s. per cwt.

Asafetida.—A lot of seven boxes fair block sold at 75s. per cwt.

Balsam peru.—Four cases of direct import from Acajutla were limited at 5s. per lb.

Benzoin was quite neglected: good fair Sumatra seconds were obtainable at £7 10s. to £7 15s., with fair almondy seconds at £6 10s. to £6 15s., and country cut £6 to £6 5s.; thirds, 75s. to 90s.; of Siam, small to medium free almonds, were obtainable at £25; loose pea and bean size at £22, and part blocky siftings at £18 10s. per cwt.

Buchu.—The chief parcel offered was eleven bales without reserve, which sold at from 7½d. to 8½d. (one lot) per lb., for fair greenish round partly stalky, and at 7½d. for ordinary stalky yellowish and bronzy round; ovals (two bales) sold at 6d. per lb. Under protected conditions a lot of eight bales fair round slightly stalky offered at 10½d., and a bale of good round sold at 11d. per lb.

Calumba.—A lot of forty bags small to bold washed yellowish offered and sold without reserve at from 12s. 6d. to 13s. 6d. per cwt. Twenty bags ordinary dark sorts were bought in at 15s. per cwt.

Cardamoms.—A good assortment offered, but the only public business done was four cases of extra fine bold pale selected Ceylon-Mysore at 4s. 9d. per lb.

Cascara sagrada.—A lot of 51 bags fair quilly old bark was bought in at 50s. per cwt.

Cascarilla.—A parcel of 46 packages offered, fair quill of which was limited at 2s. 2d. per lb. and siftings at 1s. 8d.; sales have been made privately at these prices.

Cassia fistula.—A lot of 25 packages ordinary part wormy and part rattley pod was retired at 25s. per cwt.

Chamomiles.—Six bales of fair white Belgian last year's crop were limited at 120s. per cwt.

Cinchona.—A lot of nine bales of broken Succirubra quill from Guayaquil analysing 2.96 per cent. quinine sulphate and 9.65 per cent. total alkaloids was offered and bought in at 1s. 2d. per lb. Eight bales flat Cartagena slightly country-damaged were bought in at 9d. per lb. Of East Indian bark, 26 bales offered, comprising nine bales Succirubra chips (q.s. 2.73 per cent.; t.a. 7.04 per cent.), which were bought in at 7d., and 17 bales Succirubra root (q.s. 2.25 per cent.; t.a. 8.52 per cent.) were bought in at 7½d. per lb.

Colocynth.—Eleven bales common Sudan pulped were bought in at 7d. per lb.

Dragon's blood.—The offerings comprised a single case of unusually fine bright reboiled Singapore lump, for which £40 per cwt. was wanted; two cases of good reboiled lump sold at £26 per cwt.

Eucalyptus oil.—A lot of 50 cases B.P. oil varying from 70 to 75 per cent. eucalyptol was limited at 1s. 1d. per lb.

Gamboge was in fair supply, and Siam pipe of fair to good orange quality partly blocky was obtainable at from £16 to £17 per cwt.

Guaiacum.—A lot of 15 packages, of which 11 cases comprised fair to good glassy block, offered, the limits being from 1s. 9d. to 2s. per lb.; three bags middling part drossy were held at 1s. 4d. per lb.

Gum acacia.—A lot of eight bags ordinary part woody Ghatti was retired at 37s. 6d. per cwt., at which sales have been made privately. For 25 bags fair bleached Kordofan gum 90s. per cwt. was wanted, and cleaned Kordofan sorts were available at 44s. per cwt. 22 sacks fair Aden sorts were limited at 35s. per cwt.

Honey.—There was a good assortment of honey partly new crop Jamaica, and although prices seemed favourable there was little public bidding. Of Jamaica, 487 packages offered and ten sold at 28s. per cwt. for pale set; whitish set was available at from 28s. to 30s.; pale set, 25s. to 28s.; cream set, 24s. to 26s.; dark to light amber, part liquid part set, from 20s. to 25s. per cwt.; 42 cases Guatemala offered and bought in at 35s. for good pale to brownish set and setting; privately sales have been made at this price; 78 cases Australian were bought in at 22s. 6d. per cwt. for amber setting, and private business has been done at the figure; 100 cases Siberian were limited at 22s. for brown to cream set, and 100 cases Caucasian at 21s. for liquid amber.

Ipecacuanha.—The market was overshadowed by the offering of 38 bales of so-called Manacs description of mostly fair average quality and less stemmy than Matto Grosso. The limit for sound quality was 7s. per lb., with no bidding. Seven bales Matto Grosso were held at from 6s. to 6s. 6d. per lb. for ordinary stemmy to fair average quality. Four bales Minas were limited at 5s. 9d. per lb.

Kola.—For eleven bags mostly fair West Indian dried halves 2½d. per lb. was asked, and five bags of usual West African quarters were retired at 2½d. per lb.

Liquorice juice.—Three cases block, origin not given, sold without reserve at 35s. per cwt., being rather below current value. The quality was not fair average.

Olibanum.—Two cases of pea siftings sold at 75s. per cwt. Siftings were held at from 40s. to 42s. 6d., and drop at from 60s. to 80s. per cwt.

Orange peel.—There was an absence of good bright so-called Maltese machine-cut strip, the bulk being ordinary to middling dull, which was limited at from 5d. to 6d. per lb.

Rhubarb.—The only public sale was two cases of good Shensi pickings at 3s. per lb. subject to sellers' approval. Medium round Shensi with two-thirds greyish pinky fracture was limited at 4s. 9d., and bold flat ditto at 4s. 3d.; round Shensi was bought in at 4s. 6d., Canton at 2s. 9d., flat High-dried at 1s. 5d., and common round High-dried at 1s. 1d. to 1s. 4d. per lb.

Sandalwood.—Seven bales E.I. chips were limited at £7 per cwt.

Sarsaparilla.—Genuine grey Jamaica was 2d. per lb. cheaper, four bales selling at 1s. per lb., and a further quantity was available at that price. Native-Jamaica failed to sell, the limits being from 1s. to 1s. 3d. per lb. as to quality. Mexican was bought in at 8d. per lb.

Senna.—There was practically no demand: four bales of common stalky Tinnevelly sold at 1½d. per lb., and for dark to medium *pods* from 4d. to 5½d. per lb. was wanted; a bid of 4d. per lb. is to be submitted for dark. No good green Tinnevelly leaf offered; medium to boldish was held at from 3½d. to 5d. per lb. Alexandrian pods were in fair supply, comprising a line of 18 cases fair green hand-picked stout, offered in one lot, for which 3s. per lb. was wanted; in another instance good green stout hand-picked was held at 4s. 3d.; medium brownish, 1s. 6d. to 1s. 9d.; ordinary flimsy broken, 3d. to 4d. per lb. Of Alexandrian broken leaf ten bales offered and were bought in at 6d. to 7d. per lb.

Squill.—A lot of 20 bags ordinary brownish was retired at 14s. per cwt., gross for net.

Strophanthus.—For three bags genuine (100 per cent.) Kombe 5s. 3d. per lb. was asked.

Tonka beans.—For good frosted Para, 1s. 1d. per lb. was wanted, and three casks fair Angostura were obtainable at 4s. 9d. per lb.

Turmeric.—A parcel of 20 bags fair Madras finger was bought in at 20s. 6d. per cwt., and for 40 bags of Cochin split bulbs 18s. 6d. was wanted.

Wax (bees).—There was no public demand. The offerings included 40 packages fair brown Conakry block, for which £5 per cwt. was wanted; 20 blocks fair brown Abyssinian were limited at £5, and 20 packages fair brown Benguela block at £5. The following were also on offer, the prices indicated being the sellers' limits: six packages Jamaica, £5 5s. to £5 15s.; 15 cases white bleached Calcutta, £6 to £6 5s.; 10 bags fair brown Madagascar block, £5; 19 bags Morocco, £5; 23 bags fair East African block, £5; 20 bags via Leningrad had been sold privately.

Next Auction—September 24

Correspondence

Letters should be written on one side of the paper only. Correspondents may adopt an assumed name, but must in all cases furnish their real name and address to the Editor.

Necklaces for Customers

Sir,—By this morning's post arrives the birthday gift offer of necklaces to be given away with every packet of Radox. This gift offer does not appeal to many of us as pharmacists and is not quite in keeping with our professional instincts, but this is not the point with which I am chiefly concerned. The offer to the public by the chemist is conditional upon his purchasing further stocks of Radox, and this to my mind is the chief fault to find. The offer of necklaces is being nationally advertised; chemists who have not any supplies will lose sales, will lose customers, are not up-to-date and their stocks of Radox must be old. These very chemists are probably the biggest buyers of Radox and the firm's best customers; and the wisest buyers because they purchased their supplies on the best terms offered last April. Would it not be greatly to the advantage of the manufacturers if they provided every chemist with free necklace showcards and a supply of postcards, one to be handed to each purchaser of Radox during a certain period, enabling the customer to send to the firm for the gift? No chemist would then lose any sales, all would probably gain, the firm would benefit very considerably by an ubiquitous window display, the goodwill towards the firm would not be shaken and stocks would be sold in rotation as manufactured. The offer of purchasing special stocks might still be made, in which case those availing themselves of it would not receive any postcards. For a very long time the special offers to the public made by this firm have all been subject to further purchases by the retailer, and it is the small buyer who usually reaps the advantage. What is the attitude of the P.A.T.A. concerning these gift schemes? Which packet of Radox is protected at 1s. 6d., the one containing the gift or the one without?—Yours truly,

H. G. Tibbett (21/7).

Sutton Common.

Buying for Immediate Needs

Sir,—The advice of "Festina Lente" (*C. & D.*, July 11, p. 57) to buy only for immediate needs, is good advice at the present moment, when buying for a retail chemist's business is one of the most difficult and constantly varying problems that we could have to solve. Slowness of turnover is at its worst with regard to drugs; every pharmacy has shelves full of tinctures and other drugs which are only required once in several weeks or months. It is obvious that to buy in quantity for discount is of no advantage if the goods remain on hand for so long that the value of the discount is dissipated, but, on the other hand, to buy some things, such as patents, in small quantities is to lose both discount and a window display bonus. The only thing to be done is carefully to watch the sales and thus get a guide as to which are the quick sellers in the locality and will be worth buying direct. I agree with "Festina Lente" that the nimble sixpence has made more than one man's fortune, and also that the pushing of large sizes is not always judicious. I have myself given up dealing at one particular shop where they invariably tried to sell me something in excess of my requirements, and I have no doubt that other customers do the same. On the other hand, it must not be forgotten that the bazaars make a special display of all our lines that are sold in sixpenny sizes. Any young pharmacist starting in business will be obliged to feel his way until he has learned the demands of his customers, and order from the sundries house as required. He will have to lose a certain amount of discount and to that extent profit, but it is better to be content with this until the business is established and a regular *clientèle* secured.

Yours faithfully,

Progressive (18/7).

Direct Supply

Sir,—At the meeting of the Executive of the Retail Pharmacists' Union (*C. & D.*, July 11, p. 52) attention was drawn to the practice of soap manufacturers sending travellers to call on boarding houses and hotels in order to supply them direct. This is not a new complaint, although it is in a slightly different form; a good deal of this sort of thing has been complained of in connection with firms who deal chiefly with general shops, and who also deal with any form of institution, and who supply not only soap but nearly every commodity, including, it is unnecessary to add, most of the articles a chemist sells, at wholesale rates. This business is brought to one's notice every now and again when some customer expresses surprise at a price and informs the chemist that, as a rule, it is obtained a dozen at a time from "So and So." The best way of dealing with this would be for chemists as a body to refuse to deal with any firm which went behind them for business of this sort. If every chemist who came across an actual instance sent particulars to the R.P.U. a protest could be made to the offender, and if this was ineffectual members of the R.P.U. could be notified.—Yours faithfully,

Sapone (18/7).

Insurance Act Dispensing

Sir,—There is a good deal to be said in favour of the suggestion of the Wallasey Pharmaceutical Committee (*C. & D.*, July 11, p. 52) that, now that we have a National Insurance Formulary panel chemists should be able to dispense prescriptions for any area. Those of us who are established in large towns or their suburbs, where the boundaries of two or more counties are not far away, frequently have customers bringing in scripts for a Committee with which we have no contract. I had such an instance a day or so ago, where a customer had come into the town for a few days on some business. He had an attack of an old complaint and obtained a prescription from his own doctor and was then faced with the fact that he could not get it dispensed without making a journey to do so. The suggestion was not acted on, as it was considered economically unsound, but it seems to me that it would be quite feasible for such scripts to be sent to the pricing bureau for the district to be priced and paid for by the Committee in the usual way, and then the amounts added up and the bill presented to the Committee concerned. In all probability the counter-claims would balance or nearly so, and in any case the number of such scripts would not be large, so that the extra work involved could not be very onerous.—Yours faithfully,

All Scripts (18/7).

Pharmacy and Poisons Bill

Sir,—In his statement on the Pharmacy and Poisons Bill in the House of Commons (*C. & D.*, July 11, p. 33) the Home Secretary said that the Pharmaceutical Associations, in which I presume he included the Society, demanded that all doctors' prescriptions should be dispensed by pharmacists, whether they contained poisons or not. As you point out in your editorial article on the subject (p. 51), this has not been claimed by the Council; it is the dispensing in shops which they ask to be reserved to chemists, and at every meeting I have been to where there has been an explanation of the Bill and the amendments by a member of Council the qualifying words "in shops" has been emphasised every time. At the present time drug stores, or any other shop for that matter, can dispense prescriptious so long as they do not contain a scheduled poison, but as by far the larger proportion of scripts do so the balance of business that is left cannot be large. The only reason that such a clause might be valuable is on account of the doubtful position in which the new Bill leaves Part II poisons. The Government have decided to propose an amendment which will require the Poisons Board to consider the desirability of restricting the contents of Part II, so far as is consistent with public requirements, but this may mean anything, and it seems to leave the position in the hands of the Poisons Board, where it was placed before. And from this arises the possibility that if the new Part II of the schedule was relaxed to include poisons used in medicine, then the dispensing question might arise. But at the moment it looks as if the Government were not so familiar with the far-reaching effects of the Bill as pharmacists would like them to be, and not at all conversant with our objections to it.—Yours faithfully,

Amender (18/7).

Manchester Pharmacies

Sir,—The illustrations and descriptions of Manchester pharmacies in your issue of July 11 are notable for three special items of interest. First, the illustrations show a very large proportion of corner premises, nearly half those reproduced. Years ago it was considered that a chemist when opening a business should look for a corner shop if possible, as it was a more commanding position and had the extra window space, whilst the door attracted customers from both directions. Possibly these arguments do not apply with equal force to-day, for many new shops are opened in the centre of a block. This may be due partly to the heavier cost of the corner premises in these days of inflated values. Secondly, a fact which has some connection perhaps with the corner shops, the length of time which many of the businesses have been established. I wonder if there is any other town which could show so many flourishing pharmacies dating so far back, of course, in proportion to its size. And lastly, the goodly number of these pharmacies which have developed a wholesale or some other interest in addition to the retail business. Is this a peculiarity of the industrial North, or is it a witness to the business acumen of the Manchester pharmacist?—Yours faithfully,

Au Coin (18/7).

Legal Queries

Alpha (20/7).—Hyoscine hydrobromide does not come within the Dangerous Drugs Acts. While the alkaloid and its salts come within Part I of the Poisons Schedule, a preparation containing as an ingredient hyoscine hydrobromide would come within Part II.

S. C. R. (24/6).—Nicotine and salts of nicotine, emerald green, and weed-killers containing arsenic come within Part I of the Poisons Schedule, and before delivery an entry must be made in the poison-book of the date of sale, name and address of the purchaser, name and quantity of the article sold, and the purpose for which it is stated to be required. This entry must be signed by the purchaser and also by the person (if any) who introduced the purchaser to the seller.

S. J. B. (4/7).—Since the coming into operation on January 1, 1929, of the Dangerous Drugs (Consolidation) Regulations, 1928, all preparations containing diacetyl-morphine and diacetyl-morphine hydrochloride, in any proportion whatsoever, are included within the scope of the Dangerous Drugs Act. By an Order issued by the Home Secretary on April 15, 1931, five preparations containing diacetyl-morphine included in a Supplement (1931) to the B.P.C. were added to the list of preparations exempted from the Regulations. The formulas of these preparations were published in the *C. & D.*, February 21, 1931, p. 201, but Linctus Diamorphinæ, National Formulary for National Health Insurance Purposes, is not included in this list.

Miscellaneous Inquiries

When samples are sent particulars should be supplied to us as to their origin, what they are, what they are used for, and how. We do not undertake to analyse and report upon proprietary articles nor to publish supposed formulas for them.

L. P. (22/6). — Water softeners. — These are similar to bath powders (see *C. & D. Diary*, 1930, p. 279). The base generally consists of dried sodium carbonate, to which may be added either slaked lime or ammonium carbonate. These products are seldom tinted. Formulas follow: —

I		II	
Sodium carbonate, dried	4 parts	Sodium carbonate, dried	95 parts
Slaked lime in powder	1 part	Ammonium carbonate, powdered	5 parts
Perfume ...	a sufficiency	Perfume ...	a sufficiency

Other chemicals which are sometimes used are tribasic sodium phosphate and borax.

U. S. (20/8).—Neuritis powder.—This is a tasteless, greyish-white powder, containing much milk of sulphur and a little sodium compound. There is present another substance which was not identified; the powder gives a red colour with sulphuric acid, green becoming yellow with nitric acid and purple with ferric chloride. No nitrogen, chloride or sulphate is present.

G. L. G. (7/31).—Cyanide bottle.—There is no reason why the cyanide bottle, made according to instructions, should be ineffective. We think, first, that the plaster may not be perfectly fresh and dry, and, secondly, it has been made into too thin a cream. Slight deliquescence is difficult to prevent, but entomologists sometimes carry the bottles in a cloth bag in the pocket to prevent this as far as possible. Many collectors are now using a bottle partially filled with blotting paper on which is poured a few drops of ether. This is effective and may be recharged daily if desired. —Earwig control.—Obtain a supply of the grease which is normally used to protect fruit and other trees from insects; spread in a band a few inches wide under window-sills, doors and other apertures. The insects cannot pass, and every few weeks during the summer it is sufficient to rub the surface of the grease with a comb to renew the stickiness.

Taxider (7/85).—Rabbit skin preservative.—This is a coarse powder containing potash alum about 50 per cent. and common salt about 50 per cent.

A. C. P. (4/87).—Beef-pickling brine addition.—This is a pink-coloured solution of potassium nitrate 15 per cent., and sodium chloride 0.5 per cent.

Retrospect of Fifty Years Ago

Reprinted from
"The Chemist and Druggist," July 15, 1881

A Fall in Cinchona

Cinchona is accumulating to a very large extent, the stock in the port of London amounting to over 37,000 packages. The point seems to have been reached when the supply can more than meet the demand, unless under very exceptional circumstances, and it is likely that a period of low price for quinine will now set in. . . . One of the chief influences affecting the cinchona market has been the introduction of the so-called Cuprea barks, which seem to be well suited for manufacturing purposes. These barks come from the State of Santander, in Columbia, and it is yet unknown, we believe, to what extent a supply from that source may be expected. The bark is named "Cuprea," from its copper-looking appearance. [Current prices ranged from 1s. to 6s. per lb. for cinchona barks, and from 8s. 3d. to 10s. 6d. per oz. for quinine sulphate.]

THE CHEMIST AND DRUGGIST

COMMERCIAL COMPENDIUM

deals with the trade side of pharmacy

[Commenced *C. & D.*, July 5, 1924]

Urgent Deliveries.—Chemists with dispensing connections in good-class residential districts, as well as those who include a delivery service for their commercial side, will be well advised to study closely all methods likely to facilitate the dispatch and distribution of their prescribed orders or merchandise. In the dispensary it is a good policy to have a series of bins allotted to made-up prescriptions: one bin for those to be called for, one for ordinary deliveries, and one for urgent deliveries. A boy with a carrier bicycle or tricycle is probably the most suitable distributing agent, and it should be his duty to look at the urgent or special delivery bin in the dispensary every time he returns to the shop, and to deliver immediately any parcel awaiting his return. All packages should have the address clearly written in capitals, and a book should contain a record of each one dispatched, which should be initialled by the delivery boy. A special delivery service is an invaluable means of building up local confidence and of establishing a good dispensary connection. Customers should also be encouraged to use the telephone for any urgently-required articles on the ordinary sales side. A reputation for reliability in effecting urgent deliveries is of great value.

Usance.—A term formerly used in bills of exchange between this country and another, to signify the time in which they were, by custom of merchants, ordinarily payable. A bill was stated to be drawn "at usance," and it would then be understood that the amount for which it was made out would have to be paid within the time usually allowed in similar transactions. The period of the usance varied for different countries. Nowadays, instead of drawing bills "at usances," it is the practice to specify the periods of the documents; but the term usance is still occasionally employed to denote the length of time for which bills upon particular countries are usually drawn.

Usnea.—*Usnea barbata*, a lichen of the order Usneaceæ is widely distributed over the world. It is a greyish-green or straw-coloured lichen. When young it usually grows erect and is rigid, becoming limp and pendulous or drooping when older. It is common on old forest trees, more especially conifers, which are often coated with dense, shaggy fleeces, varying from a few inches to a foot in length. In some parts species of usnea are eaten by wild animals; they are also collected as fodder for domestic animals. According to the law of signatures, preparations of the long pendulous filaments were formerly recommended to strengthen the hair. The lichen has been said to benefit immoderate menstrual discharges, bloody fluxes and spitting of blood. Lindley described it as a remedy for whooping cough. Some specimens yield an orange dye. Usnea, like other lichens, has mucilaginous properties. In the early part of the nineteenth century gum acacia was difficult to procure, owing to the war with the French, who owned Senegambia and had the monopoly of the trade. In 1801 the ninth Earl of Dundonald patented a process for extracting gum from lichens, and this was recommended for calico printing, staining and manufacturing paper, and dressing and stiffening silks, etc. *Usnea barbata* contains usnic and barbatic acids and lichenin. Usnic acid, $C_{18}H_{18}O_7$, occurs in several species and is the source of the colorific principle. Barbatic acid, $C_{19}H_{20}O_7$, isolated by Stenhouse and Groves (1880), occurs in needles melting at 184° C. Like Iceland moss and other lichens that serve as a foodstuff, usnea contains a starch-like substance or carbohydrate, termed lichenin, which is capable of conversion into glucose. Lichenin, $C_6H_{10}O_5$, is a transparent, brittle mass, dissolving in hot water, and the solution gelatinises on cooling. The water-insoluble residue, when hydrolised, gives dextrose, dextro-mannose, dextro-galactose and pentosans (Ulander and Tolecus, 1906).

Ustilago.—*Ustilago maidis* (D.C.), Tul. (*V. Zeæ*, Beck) belongs to the Ustilaginaceæ, a family of photobasidiomycate fungi. The smut of maize or Indian corn (*Zea mais*) produces large and conspicuous deformations on leaves, leaf-sheaths, stems, roots and all parts of the male and female inflorescence (tassel). They are whitish gall-like swellings and blisters, containing a mass of gelatinous mycelium from which spores are produced. The swellings may attain the size of a fist or even larger. Spores appear at first as dark olive-green masses seen through the lighter green outer tissue of the host-plant. When mature, the spore masses cause ruptures of the enclosing host tissues and escape as a dusty powder. The spores are dark-brown in colour, irregularly spherical in shape, covered with delicate spines. Maize smut is regarded as more or less poisonous in human food, and both grain and straw are injurious to cattle. Corn smut was introduced into medicine about 1880 as a substitute for ergot, and was made official in the United States Pharmacopœia; but it has received comparatively little attention from physiologists, and has not obtained a position of much importance as a drug. The fungus has the reputation of being a poison, but no satisfactory examination has been made of its active principles. Albrecht and Fusch have administered the spores without injurious effect. The belief that corn smut is abortifacient to the lower animals appears to be without foundation, as in experiments made by the U.S. Department of Agriculture in 1898 no effect was produced by corn smut given to pregnant cattle. Rademaker and Fischer in 1887 separated from the fungus an alkaloid, ustilagine, soluble in water, alcohol and ether, and intensely bitter. It is crystalline and yields crystalline salts. It has been reported that the drug acts in the same manner as ergot. Zellner (1907) separated several substances from the spores: amanitol, ustilagine, a volatile base trimethylamine, diastase, a dark-brown oil containing sclerotic acid, 8 per cent. of resins, sugars, and between 4 and 5 per cent. of ash.

Usufruct.—This term is derived from the Latin "usus" (=use) and "fructus" (=fruit or enjoyment), and was applied, originally, to the right to take the fruits or produce of land belonging to other persons on the understanding that no damage should be done to the property in the process. The term afterwards came to be used to signify a temporary use or enjoyment of land belonging to someone else.

Uva Ursi.—The leaves of the bearberry (*Arctostaphylos Uva-ursi, Sprengl*), a small procumbent, evergreen shrub of the order Ericaceæ, found in Central and Northern Europe and in North America. The leaves are 25 mm. by 12 mm., spatulate, obovate, rigid, dry, brittle, margin entire, slightly revolute, veins depressed on the upper surface. They have a slight odour and the taste is very astringent. The leaves are an old remedy. They were used in medicine in the thirteenth century by the Welsh physicians of Myddfai, described by Clusius in 1601, and recommended by Gerhard of Berlin. The leaves and their preparations have been official for many years in the London and European Pharmacopœias. They have astringent, tonic, diuretic and antiseptic properties, and are used chiefly in affections of the bladder. The drug at one time had the reputation of dissolving calculi formed in the body, but this property has not been confirmed by later investigations. The dose of the powdered leaves is from 15 to 60 gr., and this should be taken in the form of a decoction which should be boiled for at least ten minutes to extract the virtues of the plant. The leaves have been used in some parts of the Continent as a dye and for tanning leather. The astringency is due to 6-9 per cent. of tannin and a small quantity of gallic acid. An important constituent of bearberry leaves is a glucoside, arbutin,

$C_{12}H_{16}O_7,H_2O$, which occurs in long, silky needles, melting at 168° C. It is hydrolysed by emulsion or by mineral acids to glucose and quinol, to which the stimulant and antiseptic properties are probably due. Arbutin is readily detected by moistening the powdered material with dilute hydrochloric acid, heating cautiously in an object glass, and collecting the sublimate of quinol which forms upon a second glass. Eschenbrenner (1930) has examined bearberry leaves by the method of Zechner, and finds they contain from 3.8 to 6.2 per cent. of arbutin. Other constituents of the leaves are methylarbutin, ukone, ericolin, quercetin and from 3 to 4 per cent. of ash.

Uzara.—The name of an East African shrub employed as a remedy for diarrhœa and dysmenorrhœa. It was introduced into Europe by the explorer Hopf, and was tested pharmacologically by Wasicky, who referred the root to a species of *Gomphocarpus* of the natural order Asclepiadaceæ. Its action was first described by Gürber (1911), and was found to be specific in the intestine, resembling opium, but without its undesirable after-effects. Kofler (1917) obtained from the root about 5 per cent. of a slightly bitter, crystalline glucoside, uzarin, relatively soluble in water and hydrolysed by acids into dextrose and uzaradin, which is strongly bitter. A dried alcoholic extract has been placed on the market in Germany. This is claimed to contain all the active principles of the drug, including 10 per cent. of uzarin, and has been introduced for the treatment of bacillary dysentery. Raymond-Hamet (1927) finds that uzarin acts on the intestinal nervous system in a manner similar to the principles found in digitalis. Windaus and Haack (1930) have confirmed the relation between uzarin and the digitalis glucosides. They prepared uzarin in a pure state, when it formed large colourless prisms melting at 268°-270°. Like other heart glucosides, it is a lactone, hydrolysed with acids into glucose and anhydrouzarigenin, the latter having the same formula as anhydrodigitoxigenin.

V

Vaccination Acts. — Vaccination is in England and Wales regulated by the Vaccination Acts, 1867-1907, and the Rules, Orders and Regulations made under those Acts. The first administrative authority was the Poor Law Board; in 1871 its powers were taken over by the Local Government Board; and in 1919 they were transferred to the Ministry of Health. As from April 1, 1930, the functions previously vested in poor-law authorities have been given to county councils, county borough councils, and in London the City Council and the metropolitan borough councils. (S.R. & O., 1930, No. 2.) A registered medical practitioner is appointed in each district as a public vaccinator, and vaccination officers are appointed for the purpose of enforcing the Acts. Each vaccination officer keeps a register. The parent of every child born in England, Wales and the town of Berwick-upon-Tweed must within six calendar months from the date of its birth cause it to be vaccinated by a medical practitioner, under a penalty; but no penalty is imposed if within four months from the date of the birth he makes a statutory declaration in the prescribed or a similar form that he conscientiously believes that vaccination would prejudice the health of the child, and within seven days of making it delivers it to the local officer. A public vaccinator must, if so required by a parent or guardian, vaccinate a child at its home. A public vaccinator forwards his certificate of vaccination to the officer, and must give the parent a duplicate if so requested; but a medical practitioner who is not a public vaccinator delivers the certificate to the parent, who must forward it to the officer within seven days. Postponement of vaccination and insusceptibility to vaccination are also provided for in the Acts. In Scotland the earliest Act relating to the subject is the Vaccination (Scotland) Act, 1863, the provisions of which resemble those of the English Vaccination Acts.

Vacuum Flask.—In 1893 Professor Sir James Dewar was carrying out his historic experiments with liquefied gases, and having obtained those gases in the liquid state the problem of keeping them liquid for a reasonable time became of the greatest importance. A vessel was formed which was known as the Dewar vessel, that took the form of two test-tubes, one within the other, cemented together at the top, the space between the two tubes being completely exhausted of air before it was fastened up. Before that was done, however, the inside of the tubes that formed the walls of the space between the two tubes was completely silvered over in the manner of silvering a looking-glass. There was, therefore, a tube surrounded by a complete vacuum in a vessel formed of silvered glass. That was what was known as the Dewar vessel, and it was almost impossible for heat to pass through the silver-covered walls and the exhausted space between them. That was perfectly well known in 1893, but a flask in that form was only used as a scientific instrument by scientific men. In order that the Dewar vessel could be adapted to the use of the multitude it was necessary that it could be shut up and the fragile glass covered with some kind of protection. The difficulty was to prevent the heat going through the cork, and Burger did this by making his flask of such a shape that the area of the nozzle was considerably less than the area of the main body. He then put on on outside covering.

Vaccines.—In his article "Specific Therapy" in the ninth edition of Hutchison and Sherren's "Index of Treatment," Sir Thomas Horder prefers to restrict the use of the term "vaccine" to a suspension of micro-organisms in a neutral medium such as normal saline solution, and to use the name "lymph" for the fluid derived from the heifer and used in the prophylaxis of smallpox. (In the Therapeutic Substances Regulations, 1927, this fluid is termed "vaccine lymph.") Thus used, "vaccine" is equivalent to *bacterial vaccine*. Treatment by means of a vaccine may be either for curative or for prophylactic purposes. The use of bacterial vaccines is intended to confer "active immunity" by stimulating the manufacture of antibodies; "passive immunity," on the other hand, is derived from the injection of immunised serum. Since Jenner performed his classical inoculation of a human subject in 1796, various changes have been made in the preparation of lymph and the newer vaccines. Bacterial vaccines, single or polyvalent according to requirements, are derived from pure cultures of causal micro-organisms with scrupulous precautions against contamination; the cultures are added to a measured volume of saline solution, sterilised, standardised (by counting the micro-organisms), and diluted with saline solution to the required number of millions per c.c. *Sensitised vaccines* are prepared by mixing a bacterial vaccine (otherwise known as an emulsion) with an immune serum, allowing to stand at room temperature for twelve hours, by which time the micro-organisms have formed a sediment, and rinsing away the serum with successive quantities of saline solution. The product consists of a bacterial emulsion containing the specific antibody required as well as the micro-organism. *Autogenous vaccines* are prepared from cultures derived from the patient in whose case they are to be used. Vaccines are usually injected subcutaneously, but sometimes into a muscle. Tuberculin vaccine given *per os* has been tried, but this method has not found general favour. Tuberculin is used for diagnostic purposes in medical and veterinary practice The Regulations made under the Therapeutic Substances Act, 1925 (*C. & D.*, 1927, I, 499, *et seq.*; 1931, I, 682), prescribe tests and conditions of manufacture for vaccine lymph and tuberculins, and conditions of manufacture and labelling instructions in respect of other vaccines. The principal vaccines in general use are mentioned in the *C. & D.* Retail and Dispensing Price List. Horder, in the article just mentioned, points out that vaccines deteriorate on keeping, and suggests that, whenever possible, the vaccine used should be freshly prepared for each patient.

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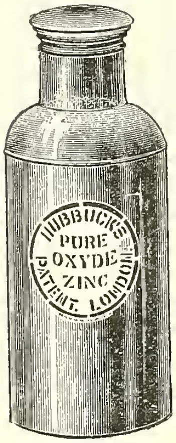

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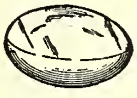

Capsule intact, showing no mark objectionable to the physician.

[Ergoapiol (Smith) is to be had only in packages of twenty capsules each—never supplied in bulk or other form.]

MARTIN H. SMITH CO., New York, N. Y., U. S. A.

A NATION WIDE DISTRIBUTION SERVICE FOR SOUTH AFRICA

One of the difficulties which beset any manufacturer in an overseas market is that of efficient distribution.

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TARTARIC ACID IN POWDER CRYSTALS and GRANULATED

GUARANTEED IN STRICT ACCORDANCE WITH B.P.'14

ACID PYROPHOSPHATE OF SODA

Quality in all respects equal to Cream of Tartar, especially as regards stability of Baking Powder

SPECIAL QUOTATIONS

to WHOLESALE BUYERS and PACKERS of the following lines:

COCOANUT OIL SHAMPOO
OLIVE OIL SHAMPOO
RASPBERRY VINEGAR

The above "fine quality products" at competitive rates are offered at very attractive prices for contracts over twelve months.

Samples and quotations will be sent on receipt of enquiry stating approximate quantities required.

Established 1786.

J. C. ARNFIELD & SONS, LTD.
GADSBY WORKS,
Princes Street :: STOCKPORT

Tablets

Enquiries are invited for

ASPIRIN AND CASCARA TABLETS

In Bulk or Packed.

A **Customer writes**:—"Re Aspirin Tablets. Your sample was one of the best we have ever had, we anticipate doing good business with you if you can maintain that quality."—We Can, and Mean To!!

LET US QUOTE YOU.

CASTLE HUSKISSON, LTD.
Manufacturing Chemists,
Swinton Works, Moon St., Islington, N.1
ESTAB. 1768.

Private formulæ Pills and Tablets carefully and accurately prepared at lowest possible prices.

Pills

SCAT Spray INSECTICIDE

For FLIES and SUMMER PESTS

		WHOLESALE	RETAIL	
1 gallon tins	-	10/-	15/-	each
½ gallon tins	-	4/6	8/-	,,
2 pint tins	-	3/-	4/6	,,
1 pint tins	-	1/10½	2/6	,,
8-oz. bottles	-	1/-	1/6	,,
SPRAYS	-	1/6	2/-	,,

FREE CONTAINERS. CARRIAGE PAID.

Large quantities are being sold through other trades. ***This should be YOUR line.***

BLACKWELL, HAYES & CO. Ltd.
MANUFACTURING CHEMISTS
54-58 MOOR STREET, BIRMINGHAM

For hay fever Bronchial and summer colds

Gomenol nasal ointment (Rhino Gomenol) is now being advertised regularly to the Medical Profession for use in cases of hay fever, bronchial and summer colds.

New to this country, Gomenol is well known to medicine on the Continent as a nasal antiseptic. Liberal discounts. Order through your wholesaler or write direct to Sole Distributing Agents, Messrs. Coates & Cooper, Ltd., 41 Great Tower St., E.C.3.

TRADE MARK

Gomenol

the ideal antiseptic

Gomenol Laboratories, Prevet, 48 Rue des petites Ecuries, Paris, 10me.

SUMMER HOLIDAYS!

"SECTIFUGE"
ANTI-STING

Speedily reduces irritation and swelling consequent on stings, and repels insects from attacking. Nickel capped sprinkler flasks, convenient for purse, bag or pocket.

Per 5/9 doz. Per 66/- gross

P.A.T.A. 10½d.

"LOTUS"
SUNBURN LOTION

A colloidal Calamine Lotion which spreads evenly over the skin, giving perfect protection from Sun, Wind and Sea-burn. Of faint, sun-tan tint, it is undetectable and is a good basis for "make-up."

Per 7/6 doz. Per 84/- gross

SAMPLES ON APPLICATION.

DELIVERY BY RETURN.

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ANABOLIN

REDUCES BLOOD PRESSURE

THIS product has been employed successfully for some years in the treatment of high blood-pressure. The reduction brought about within one week, by so few as 15 tablets, is eloquent of its effectiveness.

ANABOLIN is being called for increasingly and can be obtained promptly through your usual wholesaler.

	Retail Price
Tabs. ANABOLIN vials of 15 tablets -	**4/6**
Sol. ANABOLIN boxes of 6—1 c.c. ampoules	**6/-**

ENDOCRINES, LTD.
WATFORD, HERTS.

·Iglodine·

THE SAFE AND PURE ANTISEPTIC,

And its Kindred Preparations, are Dependable, Quick-selling and Profitable to the Chemist.

THEY SATISFY BUYERS AND BRING REPEAT ORDERS!

IGLODINE, the Ideal Home Healer, is Highly Recommended by the Medical Faculty, and Retails at **10½d.**, **1/6** and **3/-** per Bottle. **IGLODINE Specialities include — EMBROCATION, TOILET SOAP, OINTMENT, CREAM, THROAT TABLETS, SUPPOSITORIES, SHAVING STICK, PASTILLES, NASAL DOUCHE, SALICYLATED: Also FIRST-AID OUTFITS.**

P.A.T.A. Photo-Litho Showcards. Window Display Scheme Particulars and Prices from

THE IGLODINE Co., Ltd., NEWCASTLE-ON-TYNE.

KOMPO FOR COLDS

REGD

Wholesale Prices

1/3 Size
11/6 per dozen net
3/- Size
27/6 per dozen net

Carriage Paid Gross Quantities or equivalent.

Manufactured only by

J. F. WHITE & CO., Chemists
BENSON STREET, LEEDS.

AN OLD-FASHIONED—BUT REALLY EFFECTIVE remedy for COUGHS, COLDS, INFLUENZA and BRONCHIAL troubles.

Licoricine

ACTS LIKE MAGIC

Prices 10½d., 1s. 3d. and 3s.

TERMS.

10½d. size, 8/6 per doz.
1/3 „ 12/- „
3/- „ 27/- „

Less 5% dis. on £6 orders.

Carriage paid on orders of £2 and over.

MANDALL & CO. Ltd., 17/23 Stepney Rd., Newcastle-on-Tyne.
LIVERPOOL BRANCH: 130/132 RICE LANE, LIVERPOOL (Telephone: 59 Walton).
Distributing Depot for Lancashire and Cheshire.

A NEW CARTON A NEW SHOWCARD & A BIG *NEW* *BONUS*

A striking new carton and showcard is ready! The big new bonus terms show a profit of 19/3 on a 12/- outlay. 3,300,000 people will read the Allcock's Corn Plaster advertising this week-end. They are being told to buy from a ***qualified*** chemist. Advertisements are appearing in "The People," the "Daily Sketch" and "Daily Mirror." Send for your bonus parcel now.

ALLCOCK MFG. CO.
BIRKENHEAD

3,300,000 PEOPLE WILL READ ALLCOCK'S ADVERTISING

ROBUVAL

Elixir Strontii
Bromid. et Valerian
Deodorat.

AN EXTREMELY PALATABLE CALMATIVE & NERVE SEDATIVE

8 OZ. BOTTLES **3/6**

Prepared and extensively advertised by

ROBERTS & CO.
Pharmaciens,
76, NEW BOND ST.,
LONDON, W. 1,
and at PARIS.

TRADE MARK R&Co

BLONDES *and* BRUNETTES PREFER

Snowfire CREAM

Of all the popular priced face creams, Snowfire Cream is a real "Best Seller." Women prefer this fragrant cream; retailers like to handle it because of the satisfactory profits it shows. Once sales are started they develop automatically, for the merit of the product ensures repeat orders and recommendations. Stock and display Snowfire Cream.

Handbag Containers 3d.
Dainty 6d. tubes.
Retail.

Manufactured by
F. W. Hampshire & Co. (1927), Ltd.
Sunnydale Works, Derby.

NEW PRODUCTS

now being advertised to the Medical Profession.

BIVATOL (LIPO-SOLUBLE BISMUTH)

Ampoules of 2c.c. Boxes of 12. Retail 7/-. Wholesale 66/- per dozen.

BIOCHOLINE

A solution of Pure Choline Hydrochloride 2cgm. per c.c.

Ampoules of 1c.c. Boxes of 12. Retail 7/6 Wholesale 69/- per doz.
25 ,, 15/- ,, 138/- ,,
50 ,, 22/6 ,, 210/- ,,
100 ,, 37/6 ,, 360/- ,,

BACTE-PHAGES

Therapeutic Bacteriophages (Intesti, Coli, Rhino, Pyo, Dysenteri)
Ampoules of 2c.c. Boxes of 10. Retail 7/6. Wholesale 69/- per doz.

Further particulars on request from :— **THE ANGLO-FRENCH DRUG CO., LTD.**

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238a Gray's Inn Road
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'CUTTERS' (REGISTERED) THE ORIGINAL AND ONLY 'CUTTERS' 'CUTTERS'

HEAD & NERVE POWDER

FROM YOUR WHOLESALER, OR SEND DIRECT TO PERRY'S POWDERS, LTD., LEEDS

ATLAS "KATTLEKURE"

The Best and Safest Remedy for Cattle, Horses, etc.

There is money to be made in Veterinary lines if you stock the right lines. "Kattlekure" is known throughout the country and regularly advertised in all the farming journals.

CARTER BROS., SHIPLEY, Yorks

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Most useful to the progressive Pharmacist.

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The latest Developments. 2s. post free.

Through any Medical Bookseller, or direct from :—
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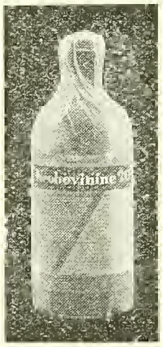

'NEOBOVININE 20'
'PETROLAGAR'
BRAND PARAFFIN EMULSION

A steady profit is assured by stocking these two products, which are being continuously presented to the medical profession by the well trained 'Petrolagar' Laboratory Company's Representatives.

Doctors prescribe them regularly. Order from any wholesaler.

PETROLAGAR LABORATORIES LIMITED
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POPULAR **Ucal** The Sign of Reliability RELIABLE

NEW Prices Pack Display Material

Take a look at your Stock NOW!

Quality unaltered—order the
Popular Brand

Ucal
Here's Health!
Ucal
The Handy Household Remedy for liver troubles
HEALTH SALT

"UCAL" HEALTH SALT

Competitive,
Profitable,
Has Public confidence

NOTE NEW TERMS:

7½d. size	-	**4/6** doz.
6 doz.	- -	4/- ,,
Gross	- -	3/9 ,,
1/- size	-	**8/-** doz.
3 doz.	- -	7/6 ,,

Send us your orders early and ensure a profitable and successful Season.

"UCAL"

CHELTENHAM. - - - - *Phone* 3021
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Big & Sure

profits from Reades EXPRESS POWDERS!

MERIT and consistent, widespread advertising have so increased the demand that no discriminating retailer can afford to be without Express Powders. Thousands use Express Powders regularly to relieve Headache, 'Flu, Feverishness and Chills; personal recommendations are continually making new customers, and new customers become regular users. Have Express Powders in stock and be sure of big profits and repeat orders throughout the year!

NOTE REVISED PRICES AND PACK.

Sizes ...	**1/3** box	**3/-** box containing 22 powders	Box for opening containing 45 Powders at **2d.** each	Box for opening containing 110 Powders at **2d.** each
Prices ...	**11/6** per doz.	**30/-** per doz.	**5/-** each	**12/-** each
Profit Yielded	**3/6** per doz.	**6/-** per doz.	**2/6** each	**6/4** each

Special Prices upon application for **£5, £10,** *and* **£25** *Parcels.*

London Distributors:

MAY, ROBERTS & CO., LTD.
7-13 Clerkenwell Road, E.C.1
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READE'S EXPRESS POWDERS

Made by: READE BROTHERS & CO., LTD.
Wolverhampton.

For OVER 75 YEARS

Dr. J. Collis Browne's CHLORODYNE

has maintained a

WORLD-WIDE REPUTATION

TO-DAY'S DEMAND BEING GREATER THAN EVER.

ARE YOU GETTING YOUR SHARE OF THIS INCREASE?

Be sure you hold stocks to meet the demand and remember that

Dr. J. Collis Browne's CHLORODYNE

IS ONLY SOLD THROUGH CHEMISTS

SIZES **1/3, 3/-**

Order from your Wholesaler with other goods.

SOLE PROPRIETORS:
J. T. DAVENPORT Ltd.
UNION STREET, S.E. 1.

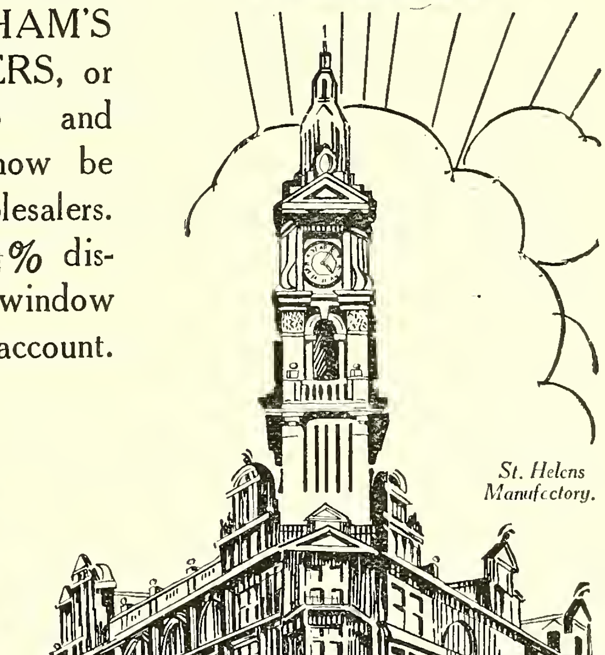
TWO DAILY SELLERS

£3 PARCELS NOW AVAILABLE

BEECHAM'S PILLS
BEECHAM'S POWDERS

CHEMISTS and Druggists should note that **£3** parcels for either BEECHAM'S PILLS or BEECHAM'S POWDERS, or assorted BEECHAM'S PILLS and BEECHAM'S POWDERS, can now be obtained direct or through their wholesalers. These **£3** parcels carry the usual 2½% discount and a further 5% discount for window display—carriage paid—Monthly account.

NOTICE—ALL ORDERS FOR BEECHAM'S PILLS AND BEECHAM'S POWDERS SHOULD BE ADDRESSED TO



St. Helens Manufactory.

BEECHAMS PILLS LTD.

ST. HELENS, LANCS.

Telephone: 1230 St. Helens *Telegrams: Beecham St. Helens.*

All the goodness of olives ripened in sunny Spain go to make "Samaritan" Olive Oil popular with all who try it. The excellent flavour and lasting sweetness bring repeat orders from every sale. Attractively packed in 2½, 5, 10 and 20 oz. bottles.

Write for prices and further particulars.

Regd "SAMARITAN"

Olive Oil

An Oil of Guaranteed Purity, pressed only from the Finest Olives rich in Vitamins.

Regd
"SAMARITAN"
Olive Oil
An Oil of Guaranteed Purity pressed only from the Finest Olives rich in Vitamins

Thornton & Ross Ltd. Milnsbridge · Huddersfield

QUICK SALES BIG PROFITS

SHOWCARDS & DISPLAY MATTER

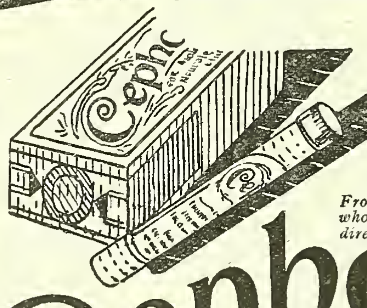
sent upon application to Cephos Ltd., Blackburn, whether you obtain supplies from us or elsewhere.

RETAILS AT 1/3 and 3/-

CEPHOS LTD. BLACKBURN

POWDERS OR TABLETS

From your usual wholesaler or write direct.



Cephos REGD

Pronounced See-foss

THE PHYSICIAN'S REMEDY

FOR INFLUENZA NEURALGIA RHEUMATISM NEURITIS COLDS

SQUIRE'S PHARMACOPŒIAS OF THE LONDON HOSPITALS

NINTH EDITION

Published by J. & A. CHURCHILL
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A systematic comparison of the formulæ of thirty-one of the London hospitals, including the Children's Hospitals and the French Hospital. The formulæ are arranged under the headings of the various preparations so that an immediate comparison may be made between the prescriptions of the different institutions.

THE BRITISH MEDICAL JOURNAL says—"The value of the book to the medical profession is even greater than that of its predecessor, since it comprises a practical compendium of all the best medical treatments."

THE LANCET says—"There can be no question of the practical utility of a book which presents an exhaustive comparison of the pharmacopœias of the London hospitals, for in these institutions the formulæ will be selected for the best reasons which the knowledge of the day can furnish, while their selectors represent leading authorities on all therapeutic questions."

Price 12s. 6d. per copy. **Post Free (inland) 12s. 11d.**

SQUIRE & SONS, LTD.

413 OXFORD ST., LONDON, W.1

Telegrams: "SQUIRE, WESDO, LONDON."
Telephones: MAYFAIR 2307 (2 lines).

MID-SUMMER ADVERTISING. 'ASPRO'

POLICY OF PROGRESS

SUMMER COMPLAINTS Quickly Banished by 'ASPRO'
SEASIDE & SUNGLASS
'ASPRO' MAKES YOU HAPPY BY MAKING YOU HEALTHY
HALF YOUR DIFFICULTIES ARE ILLUSIONS
HEALTH MAKES THEM SEEM REAL
'ASPRO' MEANS HELP and FREEDOM FOR THOSE AFFECTED
BE FREE FROM HEADACHES SLEEPLESSNESS RHEUMATISM and PAIN
THE SLEEPLESS ARMY
OBTAIN RELIEF WITH 'ASPRO'
GIVING THE WORLD WHAT IT SEEKS HAS MADE 'ASPRO' OF INTERNATIONAL IMPORTANCE

Strong as Ever! That's our advertising slogan for this summer. Although we increased our advertising last winter—and summer is not generally considered the right time to have a large advertising appropriation, we are definitely carrying out our policy of maintaining "full winter advertising schedule" during this summer. What's more, we hope to increase this again next winter. So you see, our claim of continuous advertising activity is a demonstrated fact. All chemists have to do to obtain the full benefit of this continuous flood of sales producing publicity, is to keep on showing window display material. The "longer you show" the more business you obtain from the advertising—just the same as if you had your name at the foot of the advertisement.

ADVERTISING MATTER ALWAYS AT YOUR DISPOSAL

We still have a supply of our new summer window show, stickers, etc. We will gladly send you a supply on receipt of a postcard. We also have in course of preparation an entirely new window display for the coming autumn.
By the way, do you know that YOU CAN OBTAIN 17% MORE PROFIT BY BUYING 'ASPRO' ON BONUS TERMS?

ORDER 'ASPRO' ON BONUS TERMS FROM YOUR WHOLESALER NOW

'ASPRO' consists of the purest Acetyl Salicylic Acid that has ever been known to Medical Science, and its claims are based on its superiority.

Agents: GOLLIN & CO. PTY. LTD. ('Aspro' Dept.)
SLOUGH, BUCKS. *Telephone: SLOUGH 608*

Made by ASPRO LTD., SLOUGH, ENGLAND
No proprietary right is claimed in the method of manufacture or the formula.

ASPRO REG. TRADE MARK

DISPLAY 'ASPRO' PROMINENTLY AND IT WILL SELL ITSELF

CLARKE'S BLOOD MIXTURE & OTHER PREPARATIONS

	Minimum Retail Prices	*Net Wholesale Prices*
	SIZES.	PRICE PER DOZEN
Clarke's Blood Mixture	**3/- & 12/-**	**£1 : 7 : 0 & £5 : 8 : 0**
„ Salve	**1/3, 3/- & 5/-**	**11/-, £1 : 7 : 0 & £2 : 4 : 6**
„ Aperient Pills	**1/3, 3/-**	**11/-, £1 : 7 : 0**
„ Skin Lotion	**1/3**	**11/-**

„ Medicated Soap in 3 Tablet Boxes, **2/6**, Single Tablets, **1/-** ; **7/6** doz.

Orders: Minimum quantity £16 : 4 : 0 value.
FREE CASES. Carriage paid upon orders of £100.

All Wholesale Houses keep a large stock of our Preparations and can supply smaller orders promptly

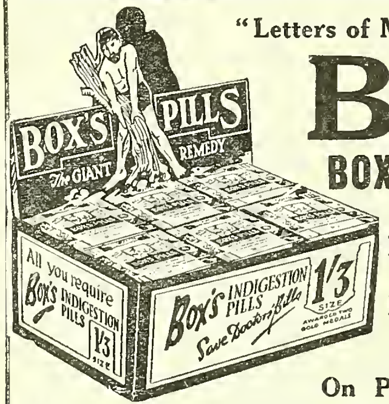
An attractive Showcard and Dummies supplied on application

Trade Mark: "BLOOD MIXTURE." Regd. No. 3275.

Sole Proprietors:

THE LINCOLN & MIDLAND COUNTIES DRUG CO., LTD.
Park Street, LINCOLN.

"Letters of Mark"—



B.P.

BOX'S PILLS

for the
British Public
per the
British Pharmacist

On P.A.T.A. LIST

In 1/3, 3/-, 5/-, 12/- and 22/- boxes

Box's Pills have a special public of their own—many of whom have had to go considerable distances to obtain their favourite medicine, or to order from Plymouth, for lack of a local source of supply. Pharmacists are now co-operating in distribution of Box's Pills in increasing numbers, and healthy local demand is developing. Stock them and show them and you will sell them. Display outers and other attractive show material free on application.

Obtainable from Wholesalers, or direct from the proprietor

W. H. BOX
GIANT PILL MANUFACTORY **161 King St., PLYMOUTH**
Telegraphic Address: "GIANT," PLYMOUTH.

FOR

SEXUAL NEURASTHENIA and IMPOTENCE.

TESTOGAN tablets and ampoules.
THELYGAN tablets and ampoules.
YOHIMBIN tablets and ampoules.
LECITHIN-YOHIMBIN pills and tablets.

CAVOSEPT (Vaginal Antiseptic).

FOR . . .

RHEUMATISM, GOUT, NEURALGIA, and SCIATIC CONDITIONS.

ATOCIN tablets.
ATOCIN WITH ASPIRIN tablets.

LIPOLYSIN tablets and ampoules for OBESITY.

BISMOLAN suppositories and ointment for HEMORRHOIDS.

ELIXIR NEUROGENIC (Cavendish) TONIC RECONSTRUCTIVE.

For literature and other information apply to:—

CAVENDISH CHEMICAL CO., (New York), LTD.
137 REGENT STREET, LONDON, W.1

The French
NATURAL MINERAL WATER
VICHY-CÉLESTINS

(and other State Springs of Vichy).

We beg to remind the Trade that the above are on the P.A.T.A. list and show a good return to retailers.

These waters are largely prescribed by Physicians, and Chemists would do well to have an ample stock on hand.

Pamphlets, Show Cards and Dummy Bottles forwarded on application.

CAUTION—Each bottle from the STATE SPRINGS bears a neck label with the word "VICHY-ETAT" and the name of the SOLE AGENTS :—

INGRAM & ROYLE LTD.

Bangor Wharf, 45 Belvedere Road, London, S.E.1

And at LIVERPOOL and BRISTOL

Telegraphic Addresses :

'Ingram Royle Watloo, London.'	'Sprudel, Bristol.'	'Célestins, Liverpool.'
Telephone : Hop 4343 (2 lines).	Telephone : 1113.	Tel. : Bank 4528.

Reminders for SUMMER

ONLY by repeat orders can a big business be built up. We have a big business due to good printing. You, Mr. Pharmacist, can also have a big business by using good labels on your good products.

Give more prominence in displaying your own packs.

We want to sell you more labels and also wish you to use them quickly for your own financial benefit.

SUNBURN LOTION,
GNAT BITE LOTION,
BLOOD COMPOUND,
SALINE, COLD CREAM

LABELS

ETC.

SKILLETS for MORNING SALTS,
FOOTBATH POWDER,
KURA, RENAL RHEUPED,
including Showcards.

Posters for Photographic DEVELOPING AND PRINTING
Red or Yellow. Six Assorted wordings - - - - **1/9**

PANEL DISPENSING POSTERS
Size 25 × 10 Three for **1/3**

SUTTLEY & SILVERLOCK LTD

92 BLACKFRIARS ROAD, LONDON, S.E.1

LOSALL'S SALT

SELLS FREELY AND READILY.

PAYS 50% ON OUTLAY.

An infallible remedy for

Gout
Rheumatism
Eczema & Skin Affections

P.A.T.A.		doz. net
4 oz. tins	1/-	8/-
8 oz. ,,	1/9	14/-
Bottles	2/-	16/-

Attractive advertising matter supplied on application.

SOLD EVERYWHERE.

Manufactured by

LOFTHOUSE & SALTMER, Ltd.
HULL.

Telephones: HOLBORN 4695 (3 LINES)

Telegrams: FORSHAPCO, HOLB, LONDON.

FORD SHAPLAND & Co. LTD

LABEL & GENERAL PRINTERS

FINE ART SHOWCARDS, CARTONS, ENVELOPES FOR SHAMPOO POWDERS, CORN SILK, ETC.

"Sol-Vo" *Sanitary Paper in Rolls & Packets.*

AGENTS FOR THE REGISTRATION OF TRADE MARKS.

GT. TURNSTILE
HIGH HOLBORN
LONDON, W.C.1

Why Doctors and Nurses have great faith in Lactogen:

Lactogen nourishes Baby quickly because it is so easily digested

Mothers can see their babies growing stronger and sturdier under their eyes, day by day—when they put Baby on Lactogen.

Baby's flesh becomes firmer—bones more dense—he's more active, nerves are steady. He's happy and healthy—really thriving. He is laying the foundation of a splendid robust constitution. For Lactogen supplies all the food elements Baby needs—and is so easily digested that Baby gets all the good of it quickly.

Even the most delicate baby can take Lactogen as his sole food from birth. Unlike raw milk, Lactogen—the dried milk food—never varies in quality or constitution.

2/9
per tin P.A.T.A.

Send to-day for full particulars and terms to Lactogen Bureau (Dept. A.Z.20), Nestlé and Anglo-Swiss Condensed Milk Co., 6 & 8, Eastcheap, E.C.3.

"LACTOGEN"
REGD. TRADE MARK
BETTER MILK FOR BABIES

Petroleum Jelly

White, Yellow, Amber, & Ruby Red, for all Pharmaceutical and Veterinary purposes

MEADE-KING, ROBINSON & CO., LTD.

22 Water Street
LIVERPOOL.

523 Salisbury Hse.
Finsbury Circus
LONDON.

Deansgate Arcade
MANCHESTER.

Martineau Street
BIRMINGHAM.

Wellington
Chambers
LEEDS.

BEE-HIVE
TRADE MARK
REGISTERED FOR OUR WELL-KNOWN BRANDS OF CERESINE WAXES.

CERESINE WAX

WHITE BLEACHED CARNAUBA WAX VARIOUS GRADES AND RESIDUE
BEESWAX WHITE, YELLOW AND COMPOSITION PARAFFIN WAX ALL MELTING POINTS
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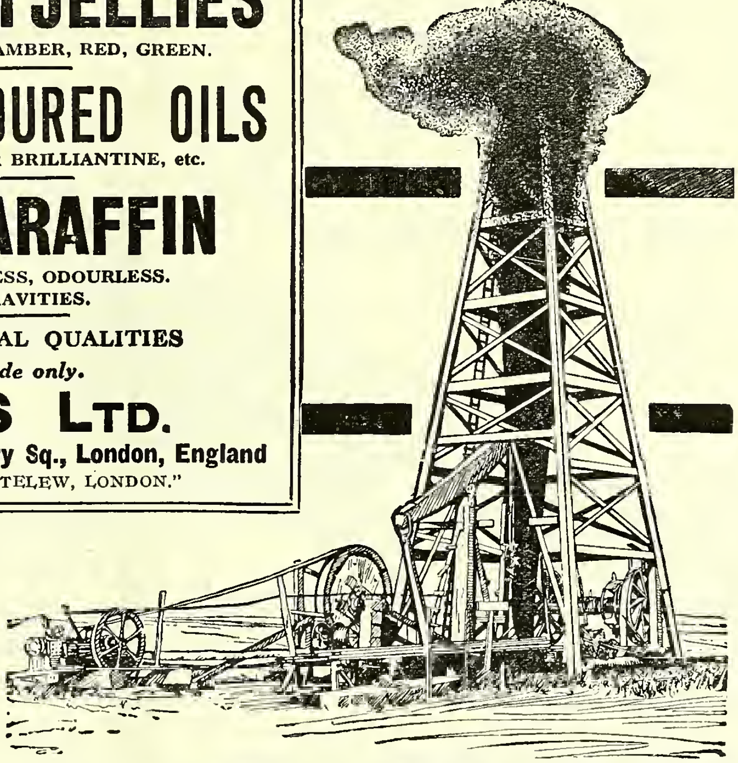

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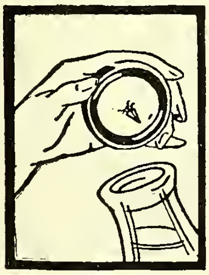

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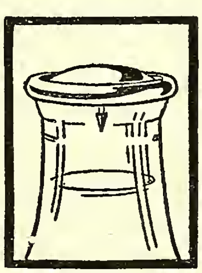

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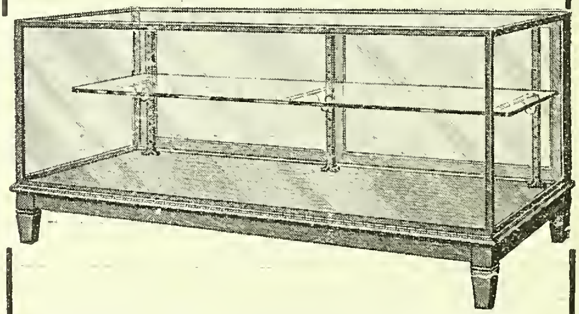

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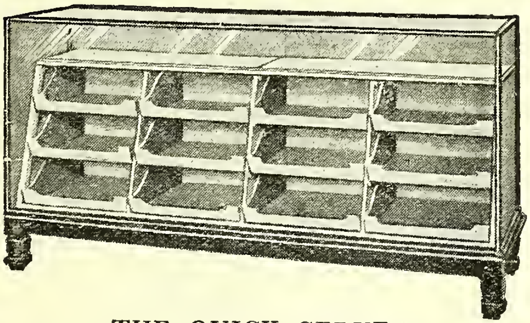

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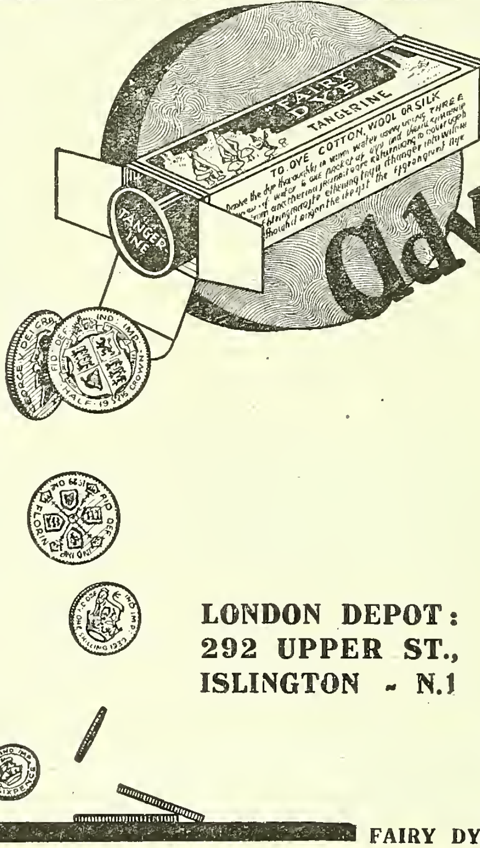
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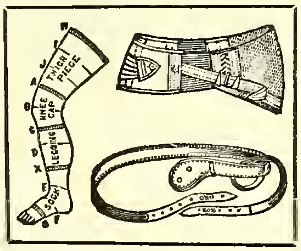

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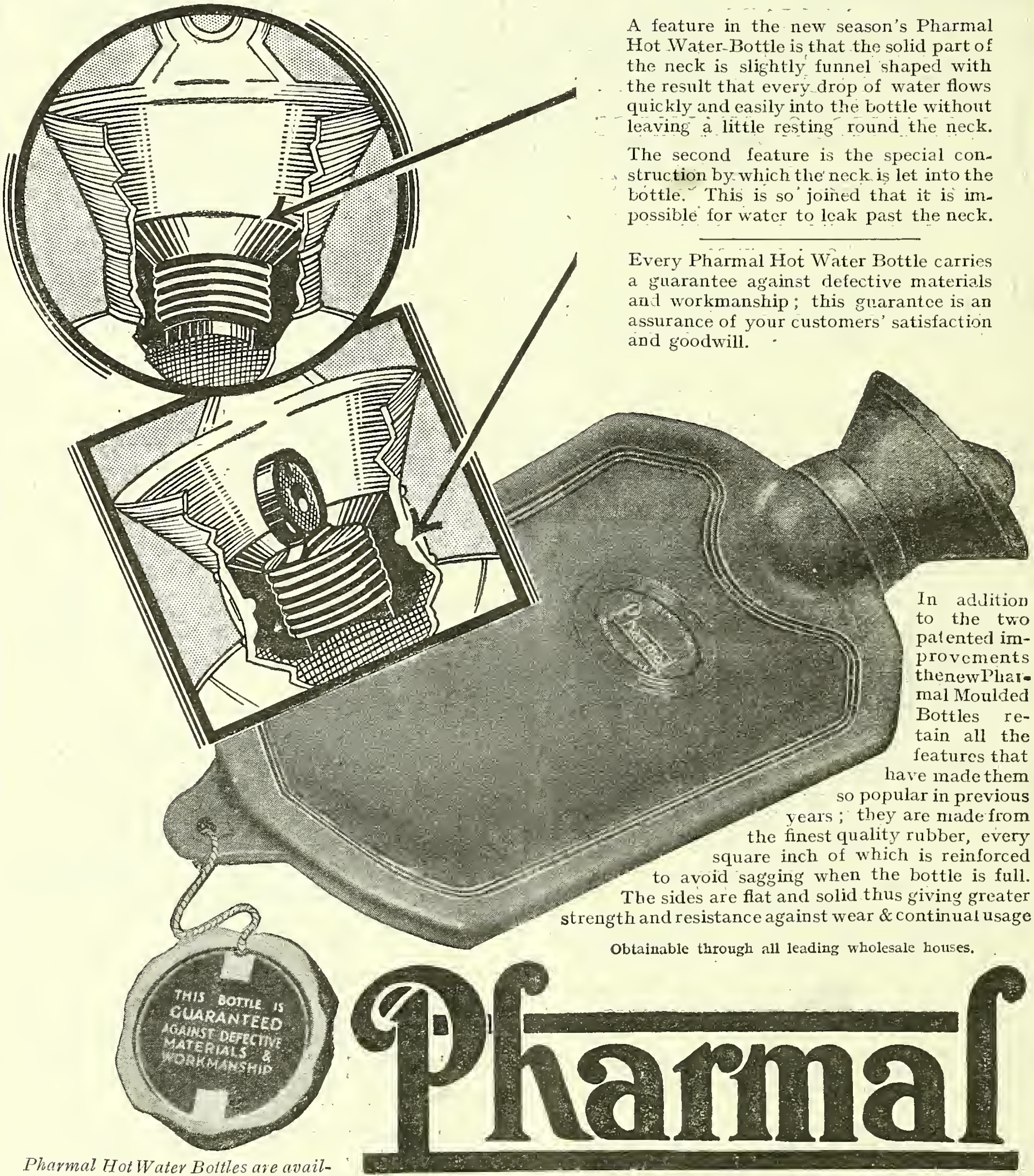
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THE CHEMIST AND DRUGGIST SUPPLEMENT

28 ESSEX ST.
LONDON, W.C.2

JULY 25, 1931

This Supplement is inserted in every copy of The Chemist & Druggist.

THE CHEMIST AND DRUGGIST SUPPLEMENT

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6.—HANTS.—Sound Medium-class Cash Retail, in pleasant growing district; returns £1,357; scope for increase; splendid modern house and large garden and garage; stock and fixtures worth £750; price, with property, £2,350; part can remain on mortgage.

7.—LONDON, N.W.—Profitable Cash Retail, in main road; returns nearly £2,200; audited figures; fine corner shop; long valuable lease; excellent stock; price £1,650; personally recommended.

8.—LONDON, N.1.—Cash Retail Prescribing and N.H.I., in densely-populated district; present returns £30 weekly, plus 600 Panel scripts monthly; can be increased; long lease; price £1,000, or valuation terms arranged.

9.—LONDON, S.W.—Sound Drug and Photographic Store; fine chance for qualified; returns over £1,300; net profit £382; audited accounts, low expenses; price £450 or offer

STOCKTAKING VALUATIONS.

We are prepared to undertake this work at special low rates and invite early applications; we are now booking dates for August onwards.

Estab. 1870. Telephone: Terminus 3574.

THE ASSOCIATION OF MANFG. CHEMISTS, LTD.

BUSINESS AGENCY, TRANSFER AND VALUATION DEPARTMENT.

Head Offices—**Kimberley House, Holborn Viaduct, London,**
E.C.1 (and at 2 Bixteth Street, Liverpool).

PARKIN S. BOOTH, Valuer.

'Phone: City 1261-2-3.

BUSINESSES FOR DISPOSAL.

1.—SURREY.—Chemist's business in residential district, held on lease 7, 14, 20 years, at £98 per annum. Established 4 years. Returns £26 per week. Price asked—Lease and Goodwill, £350. Fixtures and fittings, £600. Stock approximately £400. Further particulars on application.

2.—LONDON, S.E.—Acid, Drug and Chemical Business for quick disposal. Premises held on weekly tenancy at 14s. per week, returns average £25 per week. Stock and fixtures estimated at £500. Offers invited.

Stocktaking Valuations: We undertake this work at special rates and invite early applications.

We are now booking dates for August onwards.

ERNEST J. GEORGE

CHEMISTS' VALUER AND TRANSFER AGENT

Tel: Earnest, Walsall. **TUDOR HOUSE, WALSALL.** *'Phone: Wal.* 3774

Quotations for Stocktaking or for Pricing Chemists' Own Stock Records on Application.

(C1) LIVERPOOL.—Owing to managerial difficulties and other business interests an opportunity has arisen whereby an exceptionally good branch pharmacy with good living accommodation may be acquired; returns for last financial year exceeded £2,000; rent, £100 on lease; main road situation; imposing premises well stocked and elegantly fitted; capital requirements will be in the region of £1,500, and the business having been the subject of recent careful investigation, is confidently recommended to prospective purchasers, as constituting a thoroughly sound and profitable investment.

(C2) DORSET.—Good retail and dispensing business situated in main street of small country town; present returns, £25 to £30 weekly; rent, £72 on lease; lock-up shop; purchase price approximately £600.

(C3) CHESHIRE (EXCELLENT OPPORTUNITY FOR BEGINNER).—Pharmacy well capable of further development, situated in residential district, close to well-known seaside resort; owner going abroad on doctor's orders; main road situation; flat above premises can be rented, if desired; present *net* profits £4 weekly; accountant's figures available; purchase price approximately £600. This is a perfectly straightforward proposition that has been personally investigated, and is recommended to pharmacists with limited capital who can afford to await further developments.

(C4) LONDON, EAST.—Good family business doing £35 to £40 weekly; N.H.I. dispensing; Kodak agency; living accommodation (self-contained); stock and fixtures estimated at £750; further particulars on application.

(C5) YORKSHIRE (WEST RIDING).—Exceptional opportunity for chemist possessing foresight and initiative to acquire established pharmacy and property at a figure considerably below market value; undoubted scope; excellent position; present returns £20 to £25 weekly should be capable of double that figure. The business was for some time rather badly neglected, but under personal proprietorship the possibilities are well apparent; purchase price for business to include value of stock and fixtures only; property by agreement; post office could probably be obtained if desired.

(C6) LINCOLNSHIRE.—Retail and dispensing business showing returns of approximately £2,250 per annum; rent, £110; lease, 12½ years unexpired; further particulars on application.

(C7) NEWCASTLE-ON-TYNE.—Good retail and dispensing business well situated; turnover, approximately £1,700 per annum; low overhead expenses and high percentage net profits; large N.H.I.; living accommodation available: purchase price approximately £1,400. The business will not be available until September, but preliminary negotiations can if desired be commenced in advance.

(C8) HEREFORDSHIRE.—Old-established family and dispensing business; average turnover approximately £3,200 per annum; rent, £100 on lease; situated in busy thoroughfare and within easy reach of growing residential district.

(C9) KENT (COASTAL TOWN).—Pharmacy with optical connection, splendidly situated in busy thoroughfare; present returns, £1,950 per annum and increasing; well stocked and fitted; living accommodation available; owner disposing on account of health trouble.

(C10) KENT.—Old-established; present turnover exceeds £2,000 per annum; net profits, £500; rent, £85 on long lease; lock-up shop; good scope for increase.

(C11) DORSET.—Pharmacy with good N.H.I. connection; returns exceed £1,850 per annum; living accommodation available if desired; purchase price approximately £1,100.

(C12) BIRMINGHAM.—Retail and dispensing business doing approximately £1,300 per annum; rent, £30 per annum; living accommodation at present sub-let for £34; net profits, £350; owner entering other business for family reasons.

(C13) LIVERPOOL.—Good family retail and dispensing business with wholesale connection (optional); total returns for 1929 to 1930 financial year exceed £2,300, present year's accounts at present in course of preparation; living accommodation (5 rooms) on premises; rent, £80; lease by arrangement; main road situation; middle class neighbourhood; little unemployment; reasonable purchase price; careful investigation has been made, figures, etc., are perfectly clear and straightforward and the business should be eminently suited to a purchaser to whom the particular type appeals.

(C14) LONDON ((EAST).—Retail pharmacy, old-established, showing returns of approximately £90 weekly; premises comprise double-fronted shop and warehouse, together with good living accomodation; long lease at moderate rental; purchase price to include lump sum for lease and goodwill, stock and fixtures at valuation, or by agreement.

(C15) ESSEX.—Recently established pharmacy with good living accommodation; excellent prospects; present returns approximately £16 weekly and increasing; owner disposing on account of sudden family bereavement.

(C16) NORFOLK (SEASIDE RESORT).—Recently established pharmacy with optical connection; modernised premises beautifully fitted and of excellent appearance; present turnover under management approximately £22 weekly and increasing; rent, £70 on long lease; good reason for selling.

S. F. CLARK **CHEMISTS' VALUER and TRANSFER AGENT**

34 Marksbury Av., Richmond, Surrey Phone: Richmond 2210

Near Reading—Village business doing £1,120, price £750.
Surrey—Opportunity for beginner. Main road, £600 a.a
Middlesex—Returns £2,126, net £440, house, garden, £1,050.
W. Suburb—Death vacancy. Full details on application.
S.W.—Returning £2,045, lease 17 years, rent £80, offers.
Enquiries invited for Businesses (large and small).

BUSINESSES FOR DISPOSAL.

6s. for 50 words or less; 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

BLACKPOOL SUBURB.—Well-established Chemist's Business (8 years) with excellent House for Sale; books kept from the beginning; growing district; increasing returns; Kodak Agency; limited shopping area. Full particulars supplied to *bona-fide* inquirers. Apply in first case to 191/21, Office of this Paper.

DORSET COAST.—Good-class Retail and Dispensing Business, old-established, fitted Spanish mahogany; average returns £2,000; lease 19 years; rent £120; large house and garden; price £1,800 for fittings, lease and goodwill; stock at valuation. "Agar," c/o B.D.H., London.

EAST HAM.—Old-established Drug Stores; corner shop in main road; thickly-populated district; 11 years' lease to run; rent £133 inclusive; large house; Kodak Agency; splendid position for qualified man; value of stock and fixtures £510; an agreed sum for goodwill and lease; cause of sale death of proprietor. Inquiries, 96 High Street South, East Ham, E.6.

LONDON, W.1.—Live Business for disposal, just off main shopping street, taking about £5,000 per annum; old established; a real snip. What offers? Interview by appointment. 186/7, Office of this Paper.

LONDON (East).—Drug Store and Herbal Business in working-class district; £7 per week net profit, under management; turnover £648; rent £45; sub-let £39; rates £21; lease 11 years unexpired; Prescribing £5 per week; proper accounts kept; good reason for disposal; established 10 years; herbal knowledge easily acquired; price £400 all, or near offer. Apply "R.," 309 London Road, Croydon.

LONDON (near).—Good-class Family Retail in nice residential locality; good house; long lease; returns average over £1,300 per annum. Full particulars on application. 192/22, Office of this Paper.

LONDON, E.—Main road; N.H.I. and Counter approximately £20 weekly; no Sunday or half-day duties; renewed personal attention and recommencement Sundays, etc.; would soon return to last year's figures, viz., £25/£30 weekly; big shop; comfortable flat over; could let separately 25s./30s. weekly; rent £130; Kodak Agency; price £450; stock approximately £400 (could be reduced to convenience purchaser); no reasonable offer refused. Write for appointment. 191/25, Office of this Paper.

MANCHESTER.—Excellent corner Business for Sale; long lease; sound investment; plenty of scope; principals only. 189/40, Office of this Paper.

NEAR CAMBRIDGE.—Good-class Country Retail Business for disposal; returns approaching £3,000; well stocked; fine position; especially well-built shop, dwelling-house and warehouses; owner desires to sell premises with business. Full particulars to genuine buyers. "Man," 182/2, Office of this Paper.

PLYMOUTH.—Very old-established Business of the late H. Roper, Ebrington Street; lease 13 years; option of renewal or purchase; private Dispensing, extensive N.H.I., Kodak, Wine Licence; ill-health; must be disposed of. All particulars, Mr. Morrell, 21 Glenhurst Road, Mannamead, Plymouth.

SOUTH COAST.—Most pleasantly situated lock-up shop; Kodak, N.H.I., good D. & P.; modern fittings; well established; average takings (5 years) £1,760; average net profit £462; audited figures; rent £60; 14 years' lease; ill health sole cause of sale; no triflers please, as quick sale is desired for this genuine concern; £1,000. 192/30, Office of this Paper.

TORQUAY.—Chemist, Toilet Requisites and Photographic Business for Sale; smart lock-up shop in busy thoroughfare; Kodak Agency; rent £65 inclusive; £125 for lease; fittings, fixtures and trade utensils, s.a.v. Full particulars apply Gilley, Ltd., 71 Fleet Street, Torquay.

WOLVERHAMPTON DISTRICT.—Well-fitted, well-stocked lock-up Chemist's; N.H.I. 350 a month; gross profit £6 10s. per week; rent £25 per annum clear; lease; accountant's figures available; Kodak Agency; no near opposition; easily worked single-handed; suit young qualified, either sex; price £250, or valuation terms. 191/19, Office of this Paper.

A BARGAIN.—Drug Stores; S.W. district; £450 all at; £300 cash, remainder payments; established two years; net profits £330 and £380; audited accounts; good opening for qualified; no opposition; Kodak Agency; rent and rates £23 per annum. 190/12, Office of this Paper.

A MONEY-MAKING opportunity occurs in the Midlands for a smart young chemist with £375 to take over an up-to-date City Pharmacy on a prominent corner; well stocked and fully fixtured; Kodak Agency. Write for particulars, 192/6, Office of this Paper.

FOR QUICK SALE (Kent Coast).—Cash Retail Business, with Kodak Agency; under management; scope for increase; opposition ⅜ mile; steady trade; 7-roomed house, attached, double-fronted; electric light; modern fixtures; good stock; rent £40 per annum; rates £16 per annum; good opportunity sound bargain; price £400, or near offer; established 60 years. 189/19, Office of this Paper.

OLD-ESTABLISHED Business in main thoroughfare; in present hands over 40 years; shop and seven rooms over; lease 21 years; rent £275; price £500; stock at valuation; illness only reason for disposal. Apply, Frank Swain, Estate Offices, 170 Notting Hill Gate, W.11.

OLD-ESTABLISHED, unopposed Country Business near Derby; population 3,000; last year's turnover £2,400, steadily increasing; usual country profits; rent for large house and shop £57; lease seven years; price £500; goodwill, stock, etc. (about £850), at valuation. 192/38, Office of this Paper.

PHARMACY for Sale, Eltham district; large, well-fitted shop with pleasant house over; rapidly expanding district; price £1,000. 192/3, Office of this Paper.

RARE Opportunity.—£500 cash will purchase a sound, well-established Business and Premises on busy main road; London suburb; large, modern double-fronted shop, well fitted (mahogany) and stocked; light Retail, Prescribing, N.H.I., Kodak Agency and machine; good living accommodation; balance on property, £850, can be left on mortgage. "Onya," 191/33, Office of this Paper.

UNIQUE opportunity for fully qualified Chemist to acquire business on easy terms in new residential district. Apply Fletcher, Roseacre Office, Lytham Road, Blackpool.

£550.—Sound light Retail in good position country market town; no near opposition; low expenses; no rates; turnover £100 to £120 per month; absolutely sound proposition; genuine reason for disposal; every investigation invited; cash buyers only. 192/21, Office of this Paper.

£700.—THIS sum will purchase stock, fixtures, fittings and goodwill of nice compact Retail Business in West Riding town; annual turnover for past three years, under management, £1,250; rent £40; no agents. 191/13, Office of this Paper.

£5,000.—WHOLESALE Toilet Sundries Business for disposal, well organised, sound concern with practically unlimited scope for expansion; same owner 23 years, wishing to retire; extensive freehold premises £1,500, optional, chartered accountant's audit. Inquiries with bankers' references, please, to "Southcounts," 190/16, Office of this Paper.

APPRENTICES.

APPRENTICE wanted for Ealing district; male. 190/5, Office of this Paper.

APPRENTICESHIP required for youth, aged 19; passed Part I; good Dispensing and business training essential. Please reply to N. Richmond, 81 Lichfield Road, E.3. ('Phone East 4555.)

APPRENTICE wanted immediately; must have passed Matriculation. Arthur Lacy, Ltd., 323 Whitechapel Road, E.1.

APPOINTMENTS.

ROYAL SUSSEX COUNTY HOSPITAL, Brighton.
(246 beds).

ASSISTANT DISPENSER (Male); qualified; required; preference will be given to gentlemen with hospital experience. Commencing salary £200 p.a. with lunch and tea. Applications, together with recent testimonials, should be sent to the undersigned, from whom information concerning the post can be obtained.

L. L. W. LANCASTER-GAYE,
Secretary-Superintendent.

AGENCIES.

COMMISSION Agents wanted to sell Cough Pastilles; only first-class men with established connections and working the Wholesale trade; forceful selling campaign now being arranged for the winter, supported by national and trade advertising. Sherwood Confectionery Co., Worksop, Notts.

PARTNERSHIPS.

QUALIFIED Scot, experienced, is open to consider a Partnership in good country business in Scotland; would be prepared to take a post first as Manager with view to interest in the business if satisfactory. 190/27, Office of this Paper.

PREMISES TO LET.

OPPORTUNITY occurs to Rent unique Shop Premises, Berkeley Street, W.; suitable Chemist; assured clientele. Please communicate Sir Murland Evans, 20 St. James's Street, S.W.1.

TO LET.—New shop; excellent opportunity for Chemist; absolutely unopposed; main road between large new station and sea; centre of fast-growing business, residential and boarding house area; opposite new 'bus stop; good chemist in demand. Genuine applicants please apply to Owner, "Malaya," St. Mary's Drive, South Benfleet, Essex.

PREMISES FOR SALE.

EXCELLENT opening for Chemist, shopping centre, new district, near London; good shop and living accommodation; no opposition; last shop available. Write "A.," Smith's Library, Slough.

FREEHOLD PREMISES.—17th century Building, in main road; thoroughly renovated and redecorated; electric light; excellent opening for Qualified Chemist; £575; immediate possession upon completion. Partners, Estate Office, Linton, Cambridge.

BUSINESSES WANTED.

ADVERTISER, seeking post in established medium-class Chemist's business, with view to purchase at end of three months trial; Home counties or South-east towns; N.H.I., Photography; turnover about £1,500 per annum; living accommodation not essential; start September 1; confidential particulars. Barber, 52 Boundary Road, Chatham, Kent.

PARTICULARS are invited of Shops for Disposal in the London area; position of first importance; turnover secondary consideration. Reply, in confidence, P.C.B. 60/8, Office of this Paper.

WANTED, Businesses in London and Southern Counties returning upwards of £40 weekly; cash buyers waiting; strictest confidence observed. Apply, Orridge & Co., 56 Ludgate Hill, E.C.4.

APARTMENTS.

RESIDENTIAL CLUB FOR GENTLEMEN.
HAMPDEN CLUB, Hampden Street, N.W.1, close to King's Cross Station. Large club rooms. 300 bedrooms and bed-sitting rooms, 15s. to 25s. per week. Illustrated Prospectus, Secretary. Museum 3424.

SITUATIONS OPEN.

6s. for 40 words or less; 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

RETAIL (HOME).

BRISTOL.—Wanted, unqualified Junior Assistant (male). State age, experience, salary and references. 190/3, Office of this Paper.

LEICESTER.—Experienced qualified Manager wanted in September; high-class business; thorough knowledge of Photography essential; state age, height, experience, and salary required; no accommodation. 189/707, Office of this Paper.

LONDON, W.—Lady Assistant, Minor qualification, at once for suburban business; must be a quick and accurate Dispenser and have pleasant personality; permanent and progressive post. Please state salary and particulars in first letter. 190/34, Office of this Paper.

MANCHESTER.—Qualified Manager for Industrial business; must be good Salesman and smart Window-dresser; salary and liberal commission to progressive man. State age, experience, salary, and when at liberty, to 189/702, Office of this Paper.

MANCHESTER.—Fully experienced unqualified Assistant required; age about 35; must be courteous to customers, total abstainer, good Prescriber, Dispenser and Window-dresser; permanency and prospects for a reliable man; live out. Applicants not replied to in seven days will be treated as declined. 191/18, Office of this Paper.

MIDLANDS (Market Town).—Smart qualified Manager, with experience of Agricultural trade; keen Salesman and good Window-dresser essential; must be used to modern business methods, good prospects, salary and commission; house attached. Details of age, experience, salary, and when free, to 189/703, Office of this Paper.

SALISBURY PUBLIC MEDICAL SERVICE.—Experienced male Dispenser required; salary, with house and allowances, equivalent to £200 per annum. Apply, by letter, with references, not later than July 31, to the Secretary, 49 High Street, Salisbury.

SURREY.—Wanted, temporary Assistant, young, qualified, from August 3 to August 22. State age, reference, and salary required. 192/24, Office of this Paper.

SUSSEX.—Qualified Manager required for new branch; first-class experience and references essential; Optical qualification an advantage; good salary and living accommodation. Fullest particulars and photograph to 190/21, Office of this Paper.

A QUALIFIED Manager required for country establishment; age 30 or over; must be an experienced Salesman and Window-dresser. State salary required and supply two references. William Challice, Ltd., 9 St. Leonard's Avenue, Hayling Island, Hants.

A QUALIFIED Locum required August 29 to September 13, both dates inclusive. Please state qualifications, terms, etc., to J. H. Barker, Friendly Societies' Medical Institute, 157 Colwyn Road, Northampton.

AUGUST 4 to August 15; young lady, chiefly for Dispensing and stock; must be used to Photography; hours 9 to 7.30, 1 o'clock Wednesdays, 8.30 Saturdays; two hours off for meals; no N.H.I. or Sunday work. Please send references and salary required, or call. Neal, 56 Knight's Hill, West Norwood, S.E.27.

COUNTER Assistant (lady), age about 20 years, required at once for quick Cash business, working-class district; usual particulars. Apply Morrell & Dixon, 443 Downham Way, Downham, Bromley, Kent.

J.C.Q.O. OPTICIAN, with Pharmacy training, required immediately for middle-class business on South Coast. State full particulars of experience, height, age and salary required, enclose photo. 190/14, Office of this Paper.

LOCUM (gentleman), qualified, abstainer, for N.H.I. and general Counter work, August 10 to August 22 inclusive. Lowest terms and full particulars to J. Marlar & Son, Ltd., 49/51 High Street, Halstead, Essex.

LOCUM wanted, qualified, August 17 to 29 inclusive. State wage and reference to Randall, 7 Iona Parade, Bath Road, Cippenham, Slough.

LOCUM, for London, S.E., from August 1 to 8 inclusive. State age, remuneration and references. 191/26, Office of this Paper.

OPTICS.—Old-established Chemists in populous district, London, seek co-operation with skilled Optician (N.H.I.). Full details to "Optimist," P.C.B. 60/16, Office of this Paper.

QUALIFIED Locum required for three weeks from August 10 to 29; preferably North London; to live out; good experience necessary. Apply E. Bowen Morgan, 25 Windmill Hill, Enfield Chase, Middlesex.

QUALIFIED Chemist as Part-time Locum for two weeks commencing 24th August. Apply, "Pharmacist," King George Hospital, Ilford.

QUALIFIED Assistant (temporary) for six weeks or more; one just through examinations, used to industrial district, and resident in Leeds preferred. References and salary, by letter only, to "M.P.S.," 23 Tempest Road, Beeston Hill, Leeds.

QUALIFIED Assistant (lady or gentleman) for N.H.I. and quick Cash trade; sound business training essential. Particulars of previous experience, age, and when disengaged, to Mitchell, 39 Montpelier Vale, S.E.3.

QUALIFIED Assistant wanted now for Retail and N.H.I.; good at Counter, Window-dressing, knowledge of Photography. Send full particulars, age, experience, salary required, references; permanency if suitable. H. Buckner & Son, Ltd., The Tankerton Circus Pharmacy, Tankerton Road, Whitstable.

QUALIFIED Assistant, young, male, required for the last week in July and the month of August. All particulars to Manager, 119 South End, Croydon.

QUALIFIED Assistant wanted immediately for permanency; good Window-dresser, knowledge of Photography, and used to N.H.I. Dispensing. "D. B. C.," 43 St. Helier Avenue, Morden.

QUALIFIED man required immediately; young and single preferred. Dawsons Chemists, Ltd., High Street, Ponders End, Middlesex. Telephone: Enfield 0076.

QUALIFIED Chemist wanted immediately take charge; can acquire share if desired. Reply or call Carron, Ltd., 157 Cambridge Road, E.1.

QUALIFIED Assistant for Branch; competent Dispenser and experienced all departments. Write, giving full particulars of experience, age, height, salary required. Jackson, 645 Fulham Road, S.W.6.

PHOTOGRAPHS, TESTIMONIALS, &c.

When answering advertisements in this section applicants are strongly advised not to send (unless specially requested) ORIGINAL TESTIMONIALS or VALUABLE PHOTOGRAPHS. As can be readily understood, when an advertiser receives from 60 to 100 replies the task of returning photographs, testimonials, &c., is one of some difficulty.

RELIABLE unqualified Assistant wanted; permanency; good Salesman. Apply full particulars, Lewis Smith & Son, Hereford.

REQUIRED, live, energetic qualified man to take over, as a preliminary, management of first of line of retail shops, leading to supervisory position; seat on board offered; salary, bonus and 10 per cent. on investment. Reply, stating full particulars and amount prepared to invest. P.C.B. 60/7, Office of this Paper.

THOROUGHLY experienced man required for senior position in Drugs and Toilet Goods Section in West-End Store. Send details of age, experience, and salary required, to 189/705, Office of this Paper.

UNQUALIFIED Junior; permanency; used to good-class business, with Photography. Give full particulars first letter, and salary required. Atkinson, Chemist, High Street, Southend-on-Sea.

UNQUALIFIED Assistant (male), age 25-32, for N.W. London; must be good Salesman, Window-dresser and have thorough knowledge of Photography. Full particulars of experience, age, height, salary required, and when disengaged. 192/17, Office of this Paper.

WANTED, Junior (male), from August to October 19. Full particulars with photo first letter, Willis, Seaton, Devon.

WHOLESALE.

6s. for 40 words or less; 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

FULL-TIME Representative, with established connection among Retail Chemists in N.E. England, required to sell two nationally advertised lines; commission with guaranteed minimum and all expenses; age not to exceed 40; Yorkshireman preferred. State fullest particulars of connection and experience to 189/704, Office of this Paper.

LADY wanted; refined, artistic and energetic; experienced in Filtering, Filling, Cartoning and Packing generally; some office experience an advantage; capable of taking full charge if required; permanency and good prospects to person of system and neatness. State experience in full, age, and salary required, to Zirol Chemical Co., Ltd., Bayley House, Coventry.

PERFUMERY AND TOILET GOODS FACTORY.—Costing Clerk (female) required; must be thoroughly experienced in this class of business. Apply by letter to Factory Manager, Harrods, Ltd., 44 Hans Crescent, S.W.1, giving full details of experience, age, salary expected.

TO gentlemen having sound connection with Wholesale and Retail Chemists. The M.M.T.P. Co. are widening the scope of their activities (for their popular pack in carton) and offer a profitable proposition to commission Salesmen in centres where not already represented. Write for terms of this daily commodity, with unlimited prospects; give particulars, ground covered, lines carried. The Miss Muffet Toilet Paper Co., 1 Julian Road, West Bridgford, Nottingham.

VELOX Printers (experienced) wanted for Developing and Printing Works; salary 50s. weekly; fare paid if engaged. Apply Manager, Bathe's, Kodak Specialists, 6 Lucius Street, Torquay.

YOUNG Chemist (qualified) required by a London firm of Wholesale Druggists to take charge of their D.D.A. Register and Poison Room. State age and salary required. P.C.B. 59/39, Office of this Paper.

£2 PER WEEK and 10 per cent. commission; five live Travellers wanted for easy selling Patent Toilet line; sells at sight; must have long-established connection, car, and fidelity bond for £50; Lancashire man earns about £8 weekly; territories open, Birmingham and district, Midland Counties, East and South-east of England, South Wales, and Ireland. Full particulars to 189/706, Office of this Paper.

COLONIAL, INDIAN AND FOREIGN.

FOR the East.—Chemist; Qualified Assistant; gentlemanly appearance and address; good Salesman and Dispenser; age 22-24; single; four years' agreement; passage paid out and home. Full particulars, with photo if possible and copies of testimonials, to Box R.646, Willings, 133 Moorgate, E.C.2.

SITUATIONS WANTED.

RETAIL (HOME).

2s. for 18 words or less, 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

A.A.—ADVERTISER; 40; unqualified; 5ft. 8in.; emergency, locum, permanency; well recommended; abstainer; disengaged. Alexander, 189 Southampton Street, S.E.5.

A.A.—QUALIFIED, 21, desires Locum; Leeds and district; excellent references; reasonable terms. 15 St. George's Terrace, Leeds.

A.—EXPERIENCED Assistant; 27; West-End and varied experience; Dispensing and Counter; well used responsibility; capable; available immediately. Write or wire Smith, 32 Squirrels Heath Lane, Hornchurch, Essex.

A MANAGER, qualified, age 25, requires permanency; Birmingham or district; good experience; free August 10, or earlier by arrangement; will consider Wholesale. 191/11, Office of this Paper.

A CHEMIST, qualified (25), as Manager or Assistant; middle-class business; London or Southern Counties; salary required £5 approximately; permanency essential; interview; disengaged. "Chemist," 94 Walpole Road, Tottenham, N.17.

A QUALIFIED Chemist, 28 years, desires post as Manager; at present employed as senior in charge in business doing good N.H.I. and Counter sales; single, sober, efficient; North preferred. 190/25, Office of this Paper.

A QUALIFIED Chemist, 42, requires post as Manager or Locum; Manchester district preferred; reliable; good all-round worker. 192/4, Office of this Paper.

ADVERTISER, qualified, desires change, Manager or Asistant, with Chemist-Optician, where knowledge of practical Optics can be obtained; own full Optical equipment; passed J.C.Q.O.; only four sections S.M.C. to do; 30 years pharmacy; thoroughly capable in all departments; excellent references; interview; disengaged one month when suited; London or outskirts. Reply 189/31, Office of this Paper.

AN experienced Manager, 32, married, desires change; permanency essential; active and accustomed to busy trade. "Chemico," 190/10, Office of this Paper.

ASSISTANT, unqualified, 23, tall, smart, quick and accurate Dispenser, good Counterman, 6 years' last post, desires situation. 189/22, Office of this Paper.

AS Locum or Assistant; disengaged August 1; abstainer; 5 ft. 8 in.; experienced town and country; excellent references; moderate salary. "Locum," 1 New Road, Southampton.

AS Senior, tall, single, 25 years' high-class Pharmacy and Dispensing experience, desires permanency shortly in good-class Dispensing and Retail business; distance immaterial. "W. H.," 36 Danes Road, Exeter.

ASSISTANT; capable; Dispenser, Salesman, Photo; London experience; mid-aged; single; unregistered. "Statim," 228 Lockwood Road, Huddersfield.

ASSISTANT, unqualified; 22; honest; trustworthy; West-End and Seaside experience; accurate Dispenser, good Salesman and Window-dresser. "C.," 44 Turneville Road, W.14.

ASSISTANT; Part I; 5 years' experience; excellent all-round man; tall; highest references "Statim," c/o Deitsch, Chemists, 192 High Street, Homerton.

NAMES AND ADDRESSES.

When sending advertisements for any of the sections in this Supplement, advertisers—as a guarantee of good faith and not necessarily for publication—should always give their names and addresses. It sometimes occurs that this rule is not followed and delay and disappointment ensues. Strict attention to this detail will be appreciated.

CAPABLE, qualified man, with comprehensive knowledge of trade, requires permanency. London area preferred, in good-class business; irreproachable references; married; 33; disengaged. "Chemist," 31 Richmond Avenue, Hillingdon, Middx.

CHEMIST, 28, single, desires change between late September and Christmas as Manager or Senior; only good-class businesses. *Bona-fide* inquirers visited at my own expense when possible. 186/18, Office of this Paper.

CHEMIST'S Assistant seeks employment two weeks; knowledge of Optics. P.C.B. 59/16, Office of this Paper.

CHEMIST; male; 26; West-End and all-round experience; disengaged. "Chemist," 1 Queen's Mansions, Lavender Hill, S.W.11.

CHEMIST-OPTICIAN, used to Sub Post Office routine, desires Locum or permanency; tall; smart; thoroughly experienced all branches; terms moderate; personal interview within 50 miles any time. Apply C. G. Sansom, Chemist-Optician, Mansfield.

FREE August 10 to September 10, lady (Hall), Dispenser, experienced Hospitals. 17 Ripplevale Grove, London, N.1. North 4179.

GENERAL Assistant (lady), 28; experienced Counter, Toilet and Photographic; excellent references; disengaged. "W.," "Craythorne," New Romney, Kent.

IMPROVER.—Disengaged October 5; tall; Counter, Window-dresser and Dispenser; Midlands preferred. Cargill, 52 Boultham Avenue, Lincoln.

JUNIOR, tall, of smart appearance, desires experience; Central or N.W. London. Please write H. Biliter, 4 Pennine Drive, N.W.2.

JUNIOR; 20; keen; energetic; N.H.I., Counter, etc.; locum or permanency. Advertiser, 44 St. George's Road, London, E.7.

KATHLEEN M. FOX; qualified; locum or permanency; Northern county preferred; excellent references. 210 St. George's Road, Bolton.

LADY, 24, requires position, Locum or permanent; good Dispensing and general experience. "D.," 14 Tennyson Avenue, Twickenham, Middlesex.

LADY Dispenser (Hall); locum or permanent; Doctor or Institution. Miss Eales, Littleworth, Green's Norton, Towcester.

LADY, M.P.S., requires Locum; seaside or country preferred; free August 24; excellent experience. "Pharmacist," 140 Belsize Road, N.W.6.

LOCUM; qualified; middle age; active; reliable; well recommended; free now; been in own business. "H.," 2 St. John's Villa, Margate.

LOCUM; Assistant; 21 (Referred Pharmacy); any time until October; experience with big Multiple Company. C. Binns, 3 Intake Mount, Middleton Estate, Leeds.

LOCUM or permanent; unqualified (town or country); 25 years' experience in both. "Chemicus," 69 Upper Richmond Road, Putney.

LOCUM; experienced, active, middle age, disengaged, moderate terms. "Chemicus," 55 Clarence Street, Great Clowes Street, Manchester.

LOCUM or permanency; unqualified; competent; active; reliable; Prescriber; abstainer; single; free July 27 to August 16, engaged Derby August 17 to 30; free August 31 onwards. Permanent address, Howard, 30 Pimlico, Ilkeston.

LOCUM, qualified, 33, single, as Assistant or Manager; disengaged August 23. "Chemist," Dingley Dell, Tankerton Road, Tankerton, Kent.

LOCUM; qualified lady; "Square" trained; experienced Hospital and Retail; free August 22; London, suburbs. Phillips, 17 Scutari Road, East Dulwich, S.E.22.

LOCUM, experienced, with highest references; free July 27 to August 15 inclusive; unqualified. "A.," 131 Mount View Road, N.4.

LOCUM.—Julius Cæsar, M.P.S., 5 Marine Terrace, Weymouth. open for Locum engagements; experienced in all branches of pharmacy; highest references.

LOCUM; qualified; 33; free September 21 to October 3; within 100 miles of London. 192/13, Office of this Paper.

LOCUM-MANAGEMENT; over 30 years' experience; not registered; Hospitals, heavy Panel, Counter, Prescriber, Salesman, Stock, Books and Buyer, and good general all-round man. "G.," 130 Scott-Ellis Gardens, N.W.8.

LONDON.—Chemist and Optician, J.C.Q.O., experienced Manager, desires change; takes genuine personal interest in your business; trustworthy; highest references; present position five years; will entertain anything with prospects. M.P.S., F.B.O.A., F.S.M.C., F.I.O., 18 Brookfield Road, W.4.

MANCHESTER AND DISTRICT.—Assistant, male, unregistered, age 29; 11 years' experience; Dispenser, Prescriber; has taken charge; references excellent; salary moderate; disengaged. Vitesse, 29 Darlington Street, Cheetham Hill, Manchester.

NURSE, unqualified, two years' training, seeks position with London Surgical business; young and attractive. Miss Nancy Powell, 21 Salisbury Road, Harrow.

PART-TIME, chiefly Dispensing, desired, by experienced middle-aged man; moderate terms. "K.," 32 North Street, S.W.4.

PHARMACIST, capital £1,100, is desirous of position in good-class pharmacy with view to early succession, or might purchase suitable concern outright. 192/29, Office of this Paper.

QUALIFIED Chemist, middle age, seeks light engagement or part-time in country town. Apply Long, c/o Postmaster, Westerham Hill, Kent.

QUALIFIED Scotsman (36) desires Management; anywhere; splendid experience; own, private, company business in London, Provinces. 190/39, Office of this Paper.

QUALIFIED; Manager or Locum; excellent experience in all branches; married; state salary, if living accommodation. 190/17, Office of this Paper.

QUALIFIED lady, capable and quick, wants position in London; good knowledge of Photography and Window-dressing. 191/10, Office of this Paper.

QUALIFIED Dispenser, disengaged, middle-aged, energetic, desires post London: Chemist. Doctor or Institution; small salary. P.C.B. 59/35, Office of this Paper.

QUALIFIED, F.B.O.A., M.P.S., shortly disengaged, seeks berth with first-class Chemist-Optician in busy town near London. Press, c/o 8 Ravenswood Avenue, Rochester.

QUALIFIED, married, age 27, desires position Manager or Senior; West-End and high-class Provincial experience; good references. 192/31, Office of this Paper.

QUALIFIED, married, 10 years' London and Provincial experience, excellent references, desires position as Senior or Manager 191/12, Office of this Paper.

QUALIFIED; 10 years' experience as Manager; accustomed to good-class business; honest and conscientious; excellent references; used to full management; age 35; seeks position London or Birmingham, or near. 191/15, Office of this Paper.

UNQUALIFIED; 27; secondary education; 10 years' good all-round experience; free August 24; day or night duty; home or abroad; good-class business essential. 190/22, Office of this Paper.

UNQUALIFIED; 20 years' all-round varied experience; City and Suburban; excellent references; thoroughly reliable; married. "A. E. L.," 1,354 Stratford Road, Hall Green, Birmingham.

UNQUALIFIED Chemist, B.Pharm., experienced Dispenser, capable Counter, Window, Prescriber; age 20; salary £3. S. Doctors, 91 Stamford Hill, N.

YOUNG Chemist's Assistant, J.C.Q.O., seeks part-time employment; available all morning and whole day Tuesdays and Fridays. P.C.B. 59/17, Office of this Paper.

YOUNG man will pay fee in return for about 3 months' tuition in general pharmacy. Apply, 190/37, Office of this paper.

£2 10s.—LOCUM or permanent; disengaged; 20 years' West-End, 5 years' Hospital experience; unqualified; elderly. 192/37, Office of this Paper.

WHOLESALE.

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A.A.A.—EDUCATED man, 27, with first-class Retail training and responsible Wholesale manufacturing specialities experience, requires post. "S.," 32 Squirrels Heath Lane, Hornchurch, Essex.

A KEEN Representative seeks progressive appointment, Yorks, Lancs, Cheshire, Durham, Northumberland, etc., with Proprietory or known house. Well experienced and sound connection. First class credentials, car available, salary basis. Write, 14 Nassau Place, Leeds.

A PERFUMERY CHEMIST, with extensive practical experience manufacturing Toilet Articles, Perfumes and Concentrated Essences, desires suitable situation; moderate salary. 191/16, Office of this Paper.

ADVERTISER, 25 years' Retail and Wholesale, Continental and Far-East experience, capable staff controller, keen and conscientious worker, requires post with prospects, in London Wholesale House, Drugs, Patents, Sundries, Surgical, Toilet. "N. A. P.," P.C.B. 59/3, Office of this Paper.

ADVERTISER, established London and Suburban connection, Stores, Multiple, Chemists, Hairdressers, doing large turnover, seeks reputable lines; commission, expenses. P.C.B. 60/15, Office of this Paper.

ADVERTISER, 10 years' Retail experience, seeks position to represent good House; Midlands, West of England; moderate salary and commission to start; good Salesman; own car if required. 192/7, Office of this Paper.

COSTING, wages, orders, stocks, works and departmental figures. Trustworthy, competent man, 29, desires appointment. Packed goods, specialities trades. 190/40, Office of this Paper.

GENTLEMAN, known particularly in Yorkshire and Lancashire to Chemists and Stores, on whom he has called for some years with a Proprietary, would like a change or add another line. 189/16, Office of this Paper.

REPRESENTATIVE, prize records, valuable connection on South Coast amongst Chemists, Hairdressers, Departmental Stores, is open to negotiate with firm of repute; knowledge of Drug and Toilet trade. 189/11, Office of this Paper.

TOILET and Perfumery Traveller, 2,000 accounts in Yorkshire, Midlands and Eastern Counties, desires re-engagement reliable firm on salary basis; able drive car. "J. T. S.," 51 Burford Road, Nottingham.

YOUNG Man, six years with present employers (London Wholesale House), confidential clerk and right-hand man to general manager, desires change where efforts are appreciated in practical manner. 192/1, Office of this Paper.

Price lists, trade circulars, samples, and printed matter can in no case be forwarded, the Box numbers being intended exclusively for specific answers to particular advertisements. The Publisher reserves the right to open and refuse to forward any communications received which he may consider contrary to this rule.

We desire particularly to draw the attention of Colonial and Foreign Subscribers to the fact that in cases where they require partners, agents or assistants, or wish to sell their businesses, an Advertisement in this Supplement, placed in every copy of "The Chemist and Druggist," should be the readiest means of helping them to attain their object. The tariff for such announcements is given under the appropriate headings in the Supplement. Instructions and remittances can be sent to us direct or through the advertisers' correspondents in this country.

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SIGHT-TESTING CASE, cheap, and anything useful. "Newbiz," 104 Katherine Road, E.6.

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(*P.F. Vol* 1.)

The tenth edition of this, the most complete pharmaceutical formulary in the English language, comprises (1) selected formulas from the British, United States and several other pharmacopœias; (2) unofficial formulas from hospital pharmacopœias and other sources, British, colonial and foreign; (3) known, admitted and approved remedies (218 pages) taken from previous editions of "Pharmaceutical Formulas" and from "The Chemist and Druggist" Diaries; (4) concise descriptions of practical methods of manufacture, adapted to the retail shop; (5) an Appendix comprising laws and regulations governing the sale of poisons, the hours of closing, medicine-stamp duty, the use of spirits and many other data—e.g., a solubility table and chart **PRICE 15/-. By post 15/9**

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